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## Stainless Iron Has Unusual Merits

Ease of Fabrication When Annealed—Resists Corrosion  
—Strength Increased by Heat Treatment—  
Results of Extensive Tests

BY T. W. DOWNES\*

**R**EMARKABLY good resistance to corrosion by both fresh and salt moisture, ease of fabrication in the annealed condition and vigorous response to simple heat treatment are among the outstanding merits of certain low-carbon chromium-iron alloys, commonly known as stainless irons, which are finding increasing industrial applications and which promise to replace to a certain extent the usual steels and non-ferrous metals used in the construction of aircraft.

A series of tests of a metal of this type, carried out with the object of determining its characteristics and particularly its suitability for use in the construction of fuel and lubricating tanks for aircraft, have been completed recently at the Naval Aircraft Factory. Results of these tests, the most important of which are about to be described, are, with few exceptions, quite favorable to the metal.

The metal tested was received from the manufacturer in the form of annealed sheets 0.060 in. thick, all mill scale having been removed by pickling, which produced a uniformly rough, gray finish not unlike that resulting from sand blasting with fine sand. Chemical analysis showed the metal to be of the following composition:

	Per Cent		Per Cent
Carbon .....	0.10	Silicon .....	0.20
Manganese .....	0.45	Chromium .....	12.03
Phosphorus .....	0.026	Iron .....	Remainder
Sulphur .....	0.030		

A number of longitudinal and transverse tensile and bend specimens were prepared for tests of the metal as received and after various heat treatments. Tensile specimens were provided with a gage length  $\frac{3}{4}$  in. x 3 in., and bend specimens were 1 in. x 4 in., with rounded edges, to prevent starting of cracks at this location.

### Heat Treatment

Annealing of specimens was done by heating in an electric muffle furnace to the annealing temperature, holding at this temperature for 20 min., and allowing to cool slowly in the furnace. Annealing temperatures of 1400, 1550 and 1700 deg. Fahr. were used.

Specimens to be hardened were heated in an electric muffle furnace to 1800 deg. Fahr., held at this temperature for 20 min., and quenched in oil. Tempering was done subsequently in the same furnace by heating the specimens for 30 min. at temperatures from 600 to 1400 deg. Fahr. After tempering, the specimens were removed from the furnace and allowed to cool in still air.

### Tensile and Bend Tests

Results of tensile tests of the metal in the condition (1) as received, (2) after annealing and (3) after

quenching and tempering are shown in Table I. The strength as received was approximately 66,000 to 80,000 lb. per sq. in., and the elongation about 22 per cent in 2 in. By heat treatment, the strength was increased to as high as 185,000 lb. per sq. in., but this was accompanied by a sharp and rather erratic drop in elongation.

Tests of bend specimens were made by bending over a radius equal to the thickness of the material (0.060 in.) and noting the angle through which the specimen bent before the first crack appeared, and the condition after bending 180 deg., provided the specimen did not separate completely at the bend.

Results of bend tests are given in Table III. In the condition as received and after suitable annealing the metal withstood a bend of 180 deg. over a radius equal to its own thickness without cracking, both in the direction of and at right angles to the direction of rolling. Heat treatment materially reduced the bend properties.

### Hardness

Brinell and scleroscope hardness tests of the material in the condition as received and after the various heat treatments were made on the butt ends of the tensile specimens and near the ends of the bend specimens before the respective tension and bend tests were made. A pressure of 500 kg. was used in making the Brinell tests of the "as received" and annealed specimens; 3000 kg. pressure was used on the heat-treated specimens. A dial type of scleroscope was used.

Brinell and scleroscope hardness values for the material, as received and after annealing at 1400 deg. Fahr., were quite uniform at 119 and 26, respectively. These were increased to 418 and 64, respectively, by quenching in oil from 1800 deg. Fahr. Results of all hardness tests are included in Tables I and III.

### Soft and Silver Soldering

Several methods and soldering fluxes were tried but results were indifferent until the following method was used:

The surfaces to be soldered were first cleaned with emery cloth, dipped in hydrochloric acid and wiped clean of the excess acid with a clean cloth. This was followed by dipping in hydrochloric acid which had been cut with an excess of zinc, after which tinning of the surfaces was readily accomplished by the usual method. A soldered joint was then made in the ordinary manner, using a soldering iron and 50-50 tin-lead solder.

Two sheets of the metal,  $4\frac{1}{4}$  in. x 6 in., were soldered together along the 6-in. edges with  $\frac{1}{4}$ -in. overlap by the above method. After soldering, several strips 1 in. wide, having the soldered joint at the mid-

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dle, were cut from the specimen and tested in tension. Results of the tests are given in Table II.

Several attempts were made to silver solder specimens of the metal. The surfaces to be soldered were cleaned by filing and by pickling, and several fluxes, including borax and boric acid were tried, but the solder failed to adhere well to the metal. A lap joint, however, was finally made using borax as a flux, but the joint presented an unsightly, non-uniform appearance and was of doubtful strength.

### Dip and Flame Brazing

Two sheets, size  $4\frac{1}{2}$  in. x 6 in., were overlapped  $\frac{1}{2}$  in. along the 6-in. edges and spot welded together at the ends and center of the overlap. This assembly was placed in a muffle furnace held at 1000 deg. Fahr. When thoroughly heated to this temperature, the speci-

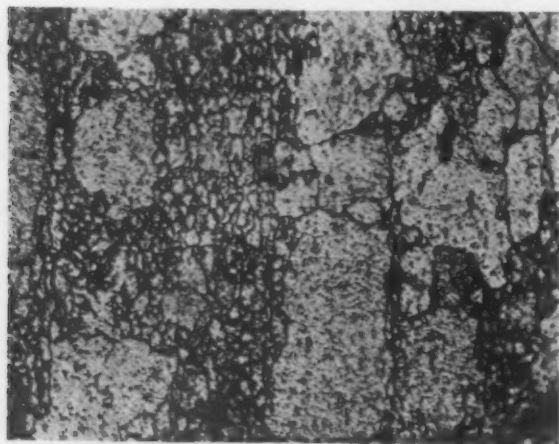


Fig. 1—Structure of Stainless Iron in the Condition as Received. Longitudinal section at 500 diameters

men was transferred to a crucible containing a molten flux of 60 per cent borax and 40 per cent boric acid held at 1650 deg. Fahr. After an immersion of 10 min. in the flux, the specimen was removed and immediately placed in a crucible containing brazing brass of the composition 70 per cent copper and 30 per cent zinc,

held at 1850 deg. Fahr. and covered with a layer of flux about 2 in. deep. After 15 min. in the brass it was removed, buried in powdered lime and allowed to cool slowly.

When cold the brass assembly was cleaned of the excess flux, electrolytic, and of the excess brass and cut into several strips  $\frac{1}{2}$  in. wide to be used for tests to determine the strength of the joints in tension. Results of the tests are included in Table II.

An assembly of two sheets of the metal, similar to that used for dip brazing, was used for a test of flame brazing. This was preheated with an acetylene flame to approximately 1000 deg. Fahr., a 60-40 borax-boric acid flux applied and a brazed joint made, using 70-30 copper-zinc brazing wire. After brazing, the specimen was cooled slowly in powdered lime, and when cold was cleaned of the excess flux and de-plated electrolytically. Several strips 1 in. wide, with the joint at the middle, were taken for tensile tests, results of which are given in Table II.

In tests of both dip and flame brazing, the brass adhered well to the metal and flowed readily between surfaces, making sound, strong joints.

### Acetylene and Electric Spot Welding

Very good results were obtained in welding with the oxy-acetylene flame when strips of the same metal were used for filler rod. The use of a flux is apparently unnecessary, although good welds were made with and without borax. Joints were also made using iron wire for welding rod, but apparently nothing is to be gained by its use, and resistance to corrosion will be greatly reduced by such use.

Cracking was at first encountered in the joints. This seemed to be caused by expansion of the metal due to heating, the edges to be welded being forced against each other with such pressure that the joint failed. This was overcome by leaving a "V" notch between the edges to be joined.

A soft, neutral flame was found to be the best for welding. This avoided excessive oxidation of the metal and embrittlement due to carburization. As in the case of the brazed specimens, strips 1 in. wide were cut from the welded assemblies for tension tests, results of which are given in Table II.

Several pairs of strips of the metal 1 in. wide and 4 in. long were overlapped  $\frac{1}{2}$  in. at the ends and joined

Table I.—Results of Tensile and Hardness Tests of (1) as Received, (2) Annealed and (3) Quenched and Tempered Material. Longitudinal and Transverse Specimens Are Marked L and T, Respectively

Spec. No.	Treatment Received by Specimen	Hardness		Yield Point, Lb. per Sq. In.	Ultimate Strength, Lb. per Sq. In.	Per Cent Elongation in 2 In.
		Brinell	Sclero- scope			
1L	As received; not treated	119	25	54,500	68,500	18.5
2L		119	27	53,200	66,000	22.5
3L		119	26	52,900	65,900	20.5
AV.		119	26	53,500	66,800	20.5
1T		119	27	59,300	75,000	25.0
2T		119	26	61,750	79,900	20.0
3T	Heated to 1400 deg. Fahr., held for 20 min. and cooled slowly in furnace	119	26	62,500	79,500	25.0
AV.		119	26	61,200	78,100	23.3
9L		119	25	51,200	66,000	23.0
10L		119	26	49,500	69,200	22.0
AV.		119	26	50,400	67,600	22.5
9T		119	25	55,750	77,700	20.0
10T	Heated to 1550 deg. Fahr., held for 20 min. and cooled slowly in furnace	119	27	57,750	78,500	22.0
AV.		119	26	56,800	78,100	21.0
11L		124	25	59,200	69,000	22.5
12L		124	27	39,000	66,500	23.0
AV.		124	26	49,100	67,800	22.8
11T		124	26	59,750	81,600	25.0
12T	Heated to 1700 deg. Fahr., held for 20 min. and cooled slowly in furnace	124	27	68,000	71,750	22.5
AV.		124	27	63,900	76,700	23.8
13L		158	33	76,900	86,250	...
14L		158	33	78,500	88,700	16.0
AV.		158	33	77,700	88,500	16.0
13T		158	31	91,500	108,500	12.5
14T	Heated to 1800 deg. Fahr., held 20 min. and quenched in oil. Tempered as indicated. Not tempered—600 deg. Fahr., 800 deg. Fahr., 1000 deg. Fahr., 1200 deg. Fahr., 1400 deg. Fahr.	158	31	91,000	105,200	12.5
AV.		158	31	91,300	107,000	12.5
23L		418	64	.....	155,000	0.5
24L		387	60	.....	185,000	1.5
25L		387	59	183,000	185,000	6.5
26L		387	57	175,000	178,000	7.5
27L		269	45	170,000	173,000	5.0
28L		119	35	.....	115,000	11.0



by electric spot welding. The metal welded readily, no flux or extraordinary technique being necessary. A specimen having one weld and another having two welds were tested in tension. Results of the tests are included in Table II.

#### Corrosion Tests

Tests of the corrosive action of the spray of a 20 per cent salt water solution were made on specimens

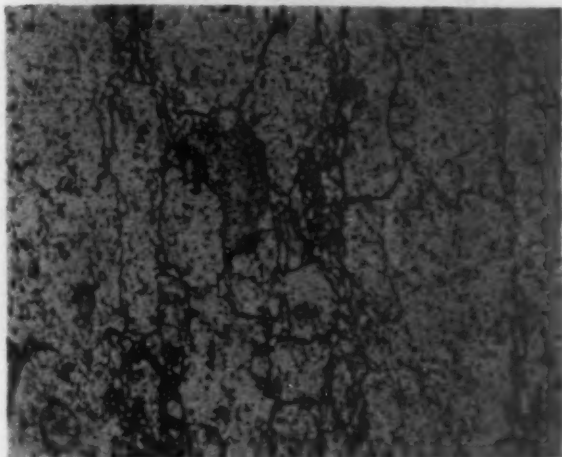


Fig. 2—Same as Fig. 1 Except the Section Is Transverse

of the material, (1) as received, (2) after heat treatment consisting of quenching from 1800 deg. Fahr. in oil and tempering at 1000 deg. Fahr., and (3) after a similar heat treatment followed by highly polishing the surface. Specimens of joints of the metal made by welding, brazing and soldering were also subjected to the salt spray. All specimens were placed in the salt spray for a period of 30 days, during which time the condition of the specimens was noted frequently.

The specimens of the material in the condition as received were rusted and pitted at the sheared edges at the end of 30 days. The unmachined surfaces and machined edges of these specimens were stained in a few places but there was apparently no pitting and no heavy oxide scale. A hardened and tempered specimen, from which the oxide scale due to heat treatment was not removed, was heavily coated with rust and deeply pitted in many places. A similarly heat-treated specimen, the surface of which was highly polished after heat treatment, withstood corrosion in the salt spray remarkably well, being only very slightly rusted at a few small areas after 30 days' exposure.

Welded, brazed and soldered joints, subjected to the salt spray for 30 days, showed no apparent accelerated corrosion at the joints except the welded joint made with iron wire as filler rod, which was rather badly rusted.

A tensile specimen immersed for 50 days in tap water was rusted slightly at the sheared edges but not attacked elsewhere at the end of the test.

Specimens immersed in aviation gasoline, a 50-50 mixture of aviation gasoline and benzol, and Gulf Refining Co. No. 9095 lubricating oil were not corroded in 50 days.

#### Microscopy

The microstructure of the metal as received consisted of rather coarse grained ferrite and much finer grained pearlite or sorbite, small particles of carbide being distributed uniformly throughout the material. That of the metal quenched in oil from 1800 deg. Fahr. and tempered at 1000 deg. Fahr. was uniform and fine grained, being apparently sorbitic. This heat treatment appears to dissolve the carbide.

The microstructure of the metal as received and after heat treatment is shown in Figs. 1 to 3, inclusive. Etching was done with a saturated solution of

ferric chloride in hydrochloric acid to which was added about 2 per cent of concentrated nitric acid.

#### Conclusions

Results of the tests were with few exceptions very favorable to the metal, and for the sake of convenient reference, are summarized as follows:

1. The tensile properties of the 0.060-in. thick sheet material in the condition as received, or annealed, are considerably better than those of mild steel and, by suitable heat treatment, the strength may be increased to approximately 185,000 lb. per sq. in., with an elongation of about 5 per cent in 2 in. The range of mechanical properties that can be obtained by quenching and tempering is, however, apparently quite limited.

2. The annealed material is easily machined and its capacity for cold bending would undoubtedly enable it to withstand severe forming operations without cracking.

3. The resistance to corrosion by salt spray of the material as received was remarkably good except at sheared edges. This may have been due to a strained condition of the metal, which could be corrected by proper heat treatment.

4. It is evident that in order to be more than ordinarily resistant to corrosion, the surface of the metal must be free from scale. Specimens scaled in heat treatment and subsequently subjected to the salt spray test for 30 days were heavily rusted and deeply pitted. The depth of a typical pit thus produced was measured by means of the microscope and found to be approximately 0.023 in. deep. This represents a penetration normal to the surface of the metal of nearly 0.001 in. per day, which is extremely severe.

5. The metal is extremely resistant to salt spray corrosion when surface is highly polished.

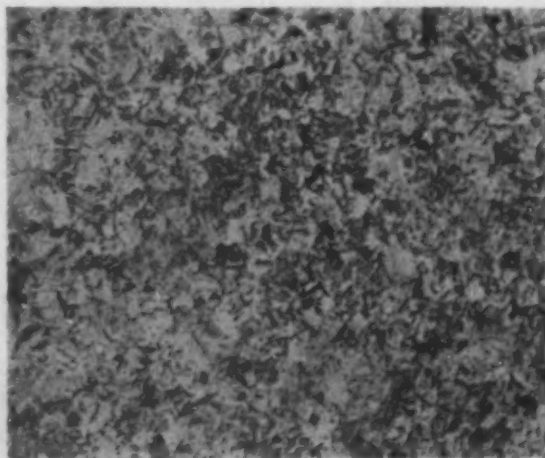


Fig. 3—Structure of the Iron Quenched from 1800 Deg. Fahr. in Oil and Tempered at 1000 Deg. Fahr. Magnification 100 diameters

6. In the annealed state the metal would be easy to fabricate, but after heat treatment by quenching and tempering, its elongation values and bend properties indicate that the amount of forming that could be done would be very limited. Shearing and machining of the annealed metal can be done without difficulty.

7. The material can be satisfactorily soft soldered, brazed, acetylene welded, and electric spot welded. This would be in favor of the metal in case of its use for fuel and oil tanks for aircraft because of the ease with which repairs could be made in the field. The fact that difficulty was encountered in silver soldering the metal is not considered important.

Tables II and III will be found on the next page.

### Tables of Tensile, Hardness and Bend Properties of Stainless Iron

Table II.—Tensile Properties of "As Received" Material After Corrosion Tests, and Breaking Loads of Various Joints 1 In. Wide. (Brazed and Soldered Joints Were Overlapped  $\frac{1}{2}$  In.)

Spec. No.	Treatment	Y. P., Lb. per Sq. In.	Ult. Str., Lb. per Sq. In.	Per Cent Elong. in 2 In.	Description of Corrosion
4L 4T	30 days in salt water spray	42,739	70,627	20.0	Rusted at sheared edges only
		43,710	77,893	22.0	
5L 5T	50 days in tap water	40,491	70,327	20.0	Slight rusting at sheared edges only
		46,466	78,517	21.5	
6L 6T	50 days in lubricating oil	45,529	71,854	22.5	No attack
		50,316	78,607	23.0	
7L 7T	50 days in 100 per cent aviation gasoline	43,000	71,666	20.5	No attack
		50,252	78,611	20.5	
8L 8T	50 days in 50-50 gasoline and benzol	43,046	70,860	20.0	No attack
		47,868	78,056	23.0	
Spec. No.	Kind of Joint	Breaking Load in Lb.			Location of Failure
D1 D2 D3	Dip brazed	6,530			At joint
		6,840			
		7,550			
F1 F2 F3	Flame brazed	7,125			Edge of joint 3 in. from joint at joint
		7,330			
		7,000			
S1 S2 S3	Soft soldered	760			At joint
		340			
		1,190			
SW1 SW2	Single spot weld Double spot weld	1,170			At spot weld
		1,950			
P1 P2	Welded with parent metal	5,250			At edge of weld
		4,720			
I1 I2 I3	Welded with iron wire as filled rod	6,750			At edge of weld In weld
		4,460			
		4,120			

Table III.—Hardness and Bend Properties. Bends Were Made Over a Radius Equal to the Thickness of the Sheet. Except Where Angle of Bend is Given, Specimens Were Bent Through 180 Deg.

Spec. No.	Heat Treatment Received by Specimen		Hardness		Results of Bend Tests
			Brinell	Scleroscope	
1L 2L 3L 1T 2T 3T	As Received. Not Treated.		119	25	No cracks
			119	25	
			119	26	
			119	25	
			119	26	
			119	26	
4L 5L 4T 5T	Heated to 1400 deg. Fahr., held for 20 min. and cooled slowly in furnace		119	30	No cracks
			119	30	
			119	30	
			119	30	
6L 7L 6T 7T	Heated to 1550 deg. Fahr., held for 20 min. and cooled slowly in furnace		124	27	No cracks Cracked very slightly
			124	27	
			124	27	
			124	26	
8L 9L 8T 9T	Heated to 1700 deg. Fahr., held for 20 min. and cooled slowly in furnace		158	35	All cracked but did not separate entirely
			158	38	
			158	36	
			158	35	
10L 10T	Heated to 1800 deg. Fahr., held 20 min. and quenched in oil. Temperature as indicated	Not tempered	418	60	Cracked at 80 deg. bend
			418	60	Cracked at 30 deg. bend
11L 11T		600° F.	387	60	Cracked at 130 deg. bend
			387	60	Cracked at 45 deg. bend
12L 12T		800° F.	387	65	Cracked at 30 deg. bend
			387	65	Cracked at 10 deg. bend
13L 13T		1000° F.	364	58	Cracked at 30 deg. bend
			364	58	Cracked at 10 deg. bend
14L		1200° F.	269	48	Cracked very slightly
15L			269	48	
15T		1400° F.	119	37	No cracks
			119	37	

### Trade Associations Are a Boon to American Business

By helping to wipe out much of the bad feeling which existed formerly among competitors and by encouraging a code of business ethics, trade associations have performed a service to American industry, E. W. McCullough, manager of the department of manufacture of the Chamber of Commerce of the United States, Washington, declared in an address before the Rotary Club of Baltimore, recently.

Mr. McCullough defined a trade association as "an association formed in a field of industry or commerce with a membership so representative that all problems pertaining to this field can be adequately presented for

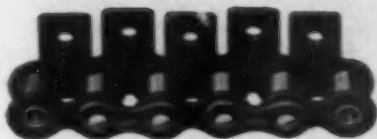
common consideration and solution, and with the purpose of developing this field so as to have the enterprise in it conducted with the greatest economy and efficiency. The title of trade association should be kept for use by those organizations which are sufficiently representative of an important branch of industry or commerce to speak for it with authority and which undertake to consider all questions of general application to the industry."

The Mahoning Valley Foremen's Association inaugurated last week a series of fall and winter meetings at the Y. M. C. A., in Youngstown, Ohio, to be addressed by professional lecturers upon psychological and related problems.



# Create Special Chain Department

Work Taken to Order Handled Separately from Standard Products—  
Promotes Better Scheduling and Routing of Production



BY BURNHAM FINNEY\*



TO meet the demand for special material without interfering with the normal production of standard chain, the Diamond Chain & Mfg. Co., Indianapolis, has a "Specials Department," which functions independently of the remainder of the plant. The department was established because of the increasing call for special kinds and sizes of chain, i.e., those having some function besides transmitting power, such as conveying, timing or indexing, and sometimes having side-plates, pins or rollers of an entirely different shape or material from those used in the standard chain. The growing demand for such chain made it difficult to schedule regular manufacturing operations satisfactorily.

Incidentally, better delivery on special orders and a more accurate record of their cost were made possible by the creation of the new department. Moreover, complete separation of the Specials Department from the main part of the factory gave the company the opportunity to control the number of its employees more intelligently. No longer are additional workmen assigned to a regular department on the plea that work of a special nature makes it necessary to have extra help.

## Department Occupies 7000 Sq. Ft.

The volume of work done by the Specials Department fluctuates considerably and is in direct ratio to the number of orders. The floor space occupied is approximately 7000 sq. ft. and, on an average, 35 workmen are employed.

Assembled in this unit of the factory is at least one of every type of machine tool used in the remainder of the plant. Present equipment consists of punch presses, forming machines, drill presses, screw machines, milling machines, assembly presses and various special machines. While many of the tools are idle a considerable portion of the time, it is economical to have them in readiness for immediate use. Efficient

manufacture of special chain demands such an arrangement.

Control of production is maintained separately from that of the remainder of the factory. The department schedules its own operations, orders its materials and tools, routes its work and is a complete operating unit within itself. Even in the engineering department there are several men who devote all of their time to designing jigs and fixtures for special operations. Furthermore, the inspection department has men whose sole duty it is to inspect the special work.

## Confusion and Loss of Time Prevented

Manifold advantages have accrued from the establishment of the department. Under the old system of routing special orders through the main plant, much confusion and loss of time resulted. For instance, work on a special job often necessitated stopping the operation of certain machines, taking down the set-up and erecting a new set-up. Such interference with the regular routine of production has been eliminated.

The fact that special chains are made in small quantities and that each order took a different route through the plant made the coordination of the regular and the special work impossible. To move the special material mechanically or in a routine way is impractical.

## Special Work Formerly Sidetracked

There was a tendency under the old system for department supervisors to sidetrack or neglect special orders, because the accumulation of regular work was always sufficient to keep the departments busy without seeking other jobs. It is not strange, therefore, that the establishment of the Specials Department wrought a marked change. Today the supervisor in that unit has only special work to do, and it is his business to produce good results.

Ten years ago practically no special chain was built. Sometimes a customer asked for special grades and sizes in regular makes, but such requests were exceptional. It was not until the chain manufacturers began

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The Screw Machine Section of the Specials Department. Assembled in the special chain unit of the plant is at least one of every type of machine tool used in the remainder of the plant

to develop special uses for chain that production of special material became a serious problem.

It was but natural that the operating departments should give standard chain the right-of-way in manufacturing channels. The difficulty of scheduling special orders and many other problems which arose led to the segregation of important operations on special work with the purpose of increasing the efficiency of production. Work on the screw machines, punch presses and the assembly machines was removed from the regular plant routine. Gradually the minor operations also were handled independently of the regular work until the Specials Department was formed.

#### Segregation Has Promoted Efficiency Throughout the Plant

Many advantages in addition to those already set forth have been realized through the operation of the

in this way to budget their supplies more accurately.

There has been a noticeable increase in the efficiency of individual workmen in all parts of the plant. The operators in the regular departments are able to do their particular jobs more efficiently when not interrupted to do special work. Furthermore, the employees in the Specials Department acquire a versatility which adds to their value.

Accurate control of the number of employees on special work is maintained. The supervisor knows how many orders are on hand and how much labor is required to fill them. As a result, the cost of special items can be determined easily and quickly.

The additional attention which special chains have received has resulted in a study of the requirements of the designers and a selection of features usually found in such designs. It has been possible to arrive at a number of types which incorporate the most pop-

*Assembling Chain in the Specials Department. Employees on special work become adept in handling different kinds of jobs. At the same time operators in the regular departments have become more efficient, because their routine is no longer interrupted by the demands of special work*



Specials Department. With all of the tools and fixtures for special work concentrated in one self-sustaining unit, the regular departments have an opportunity

ular special features, and equipment designers thus may employ chain for which tools already are made by changing only slightly their original specifications.

### Technical Sessions and Exhibit to Feature Welding Society Meeting

A comprehensive technical program has been arranged for the fall meeting of the American Welding Society, which will be held at the Broadway Auditorium, Buffalo, Nov. 16, 17, 18 and 19. An exposition of welding equipment and supplies and of a large variety of welded products is also a feature.

The exposition will open on Nov. 16 and the first technical session will be on the morning of Nov. 17. At this session a paper on "Welding of Locomotive Parts" will be presented by M. Gjersten, master welder of the Northern Pacific Co., and another on "Organization of Welding on the Railroad," by F. H. Williams, assistant test engineer, Canadian National Railways.

"Comparative Tests on Arc Welded and Riveted Structural Members" by A. M. Candy, Westinghouse Electric & Mfg. Co., and "Tests on Welded Roof Truss," by H. H. Moss, Linde Air Products Co., are papers planned for the afternoon of Nov. 17.

Discussion of "Welding Science in the Engineering Curriculum of Universities" will take place at a morning session, Nov. 18, and will be followed by a meeting of the society's welding wire specifications committee in the afternoon. There will also be a meeting of the American Bureau of Welding, which is the research department of the American Welding Society. At the latter session progress in welding research will be reviewed.

A short technical session, Nov. 19, will be devoted to "Welding in a Gaseous Atmosphere," and will in-

clude demonstrations by P. P. Alexander and R. A. Weinman of the General Electric Co.

A dinner dance will be held at the Hotel Statler, Nov. 18, and the afternoon of Nov. 19 will be given over to a visit to Niagara Falls. Following a short inspection trip through the Niagara Falls Power House, a buffet supper will be given on the Canadian side and a special illumination of the Falls will be witnessed.

### To Discuss Steel Structures

The civil section of the Engineers Society of Western Pennsylvania is sponsor for an all day conference to be held at the William Penn Hotel, Pittsburgh, Nov. 4. Technical sessions are to be held in the morning and afternoon and an informal dinner and entertainment in the evening. Papers to be presented include, "Evolution of Steel Skeleton Type of Building," by Robins Fleming, American Bridge Co., New York; "Recent Developments of Rolled Structural Sections," by A. E. Crockett, Jones & Laughlin Steel Corporation, Pittsburgh; "Foundations," by George R. Johnson, Foundation Co., Pittsburgh, and "Effect of Gunite Encasement on Structural Steel," by B. C. Allen, Cement Gun Co., Allentown, Pa.

The General Fireproofing Co. will occupy Nov. 1 additional capacity and will increase production of metal desks 150 per day. The company is now shipping desks, it is reported, at the rate of 1200 daily.





## Scrapping Ships at Ford Plant

Most of the Salvaged Material Now Being Used in Ford Industries—About 1000 Tons of Steel per Day Taken from Discarded Emergency Fleet Boats

WITH its purchase of 199 ocean boats from the United States Shipping Board for scrap, the Ford Motor Co. was confronted with the problem of taking most of these vessels to its Detroit plant and devising efficient and economical methods of scrapping. Months were spent in planning scrapping methods and in installing the equipment that is being used.

Following the general plan of progressive production as used in building automobiles, the Ford company routed various scrapping operations starting with taking the boats from the seaboard to Detroit. The original plan, when everything was set for what might be designated mass production on wrecking ships, called for the scrapping of one boat in three days. The estimate proved too conservative, as a record has been set of completely scrapping six boats in 10 working days instead of in 18 days as expected. As the amount of steel in each boat is 1700 tons, this meant the cutting up of the ships in scrap at the rate of over 1000 tons per day. A force of 970 men is employed on the work which is carried on in two 8-hr. shifts in scrapping and in three shifts in unloading the scrap from cars.

The boats purchased by the Ford company included 149 of the lake type of Welland Canal size, 251 ft. long and with 43½-ft. beam. The remainder, known as the submarine type, were 324 ft. long with 46-ft. beam. As the latter were too long to take through the Welland Canal, arrangements were made with three Atlantic Coast shipyards to scrap them. Up to Oct. 1 57 ships had arrived at the Fordson plant and of these 34 had been completely scrapped. On that date there were 28 ships that had been either completely scrapped or were in the process of scrapping on the Atlantic seaboard.

The steel from the boats in the Eastern shipyards is hauled to the Fordson plant of the company on the boats going to that plant to be scrapped. These boats are being loaded to a 12¼-ft. draft and it takes the capacity of 2¼ of the lake type boats to transport the steel amounting to 2200 tons and other material salvaged from one of the boats on the Atlantic Coast.

Boats taken to Detroit are scrapped in a slip at the Fordson plant. The first boat reached the plant May 31 and the scrapping started the following day. Seven ocean-going tugs were purchased to bring the boats from the Atlantic by way of the St. Lawrence River. They are towed by contract through the difficult channels of the river and to Ogdensburg, N. Y., from which point two Ford tugs are used for towing them through Lake Ontario and Lake Erie and the Detroit River. In addition, three of the lake type boats were reconditioned for use as tow boats in bringing vessels from Gulf ports. In good weather a tug tows two boats but with the approach of the season for rough weather in the vicinity of the mouth of the St. Lawrence, orders were given to tow only one vessel at a time.

On arriving at the Fordson plant the boats are taken into a slip in which the scrapping is done. This provides positions for 12 boats in a row on one side of the slip. The vessel is moved from one to another position for successive operations.

Handling equipment was installed the length of this slip for use in handling the material as the vessels are scrapped. This includes five 35-ton gantry cranes with 65-ft. booms, four 60-ton locomotive cranes with 60-ft. booms and one 200-ton locomotive wrecking crane with 58-ft. boom. The gantry and locomotive cranes are mounted on trucks that operate on an 18-ft. gage track running parallel with the slip and along the slip are

four standard gage tracks on which the scrap is loaded on cars. One of these tracks is located within the crane runway track so that flat cars can run beneath the crane trucks.

One of the principal problems that came up for solution was how to cut up the bottoms of the boats. Under the plan adopted the superstructure is cut down within about 2 ft. of the water's edge and the remainder of the hull is placed on a floating dry dock 250 ft. in length on which, starting at one end, transverse sections from 4 to 6 ft. wide and approximately 12 ft. long are cut from the bottom of the ship. As the boats have double bottoms, these sections are



A 52-ton boiler taken from a ship being placed on a flat car by a 200-ton crane

made up of both of the bottom plates and the connecting structural members. The larger sections weigh up to 10 tons.

In the three Eastern shipyards a floating dry dock is not used. Instead, after the superstructure is cut down close to the water's edge a steam driven winch pulls the structure partly out of the water on a marine railway and one-half the bottom is cut off in transverse sections. Then the remainder of the bottom is pulled through the water and is cut up in similar sections.

After experimenting at the Fordson plant with the use of coke oven gas in cutting torches, it was decided to use that gas in place of acetylene gas in cutting up the steel. Tests show that the cutting speed of the torches was not quite so fast when coke oven gas and oxygen was used, but this gas was cheaper than acetylene gas. Another advantage that led to the use of coke oven gas was that it eliminated the work of handling the large number of gas tanks. To supply the oxygen the company built an oxygen plant, using the liquification process. This plant is located in the basement of one of the mill buildings. The oxygen, coke oven gas, air for pneumatic tools and water are carried in a tunnel under a walk along the wharf.

The gas and oxygen supply lines are connected to headers along the wharf at the various positions of the boats. These headers have many outlets and as a rule 12 to 15 torches are at work on one boat at a time. The torches get their supply of gas and oxygen through a flexible rubber hose. Torches of a standard type are used.

#### Woodwork and Fixtures First Removed

When boats are in their first two positions they are stripped of all their woodwork. Then the vessel is moved into its next position where the stacks are cut down and other parts of the superstructure as well as sections of the deck are removed. The next operations include the moving of brass parts and electrical fittings and fixtures. At the same time a gang is removing the pipes and cutting out the propeller shaft. When the fourth position is reached the cargo of scrapped steel from boats scrapped in the East is hoisted out while other men continue the disassembling operations. At about the eighth position the engines and boilers are hoisted out. Then the sides are cut down close to the water's edge and what is left of the bulk is ready to go on the dry dock for the final operation of cutting up the bottom.

The 200-ton wrecking crane is used for hoisting the engines and boilers from the ships and placing them on flat cars. The engines, which weigh from 66 to 90 tons each, are placed on specially designed cars. Shackles are provided for handling each type of engine as well as the boilers. These save rigging and time. The shackles are bolted to the base of the engine and to these are attached four cables. The other ends of the cables are hooked to an equalizer that straddles the top of the engine and serves to balance the load. With this handling unit one engine and two boilers have been hoisted from a boat and placed on cars in 1½ hr.

The bulk of the steel as it is scrapped is handled directly by the cranes from the ship to a car. The smaller material is piled on steel trays about 5 ft. 6 in. x 6 ft. 6 in. in dimensions and when the tray is filled it is hooked to a crane and the contents dumped in a gondola car.

From 90 to 105 carloads of scrapped material are recovered each day from the scrapping operations. This is unloaded around the steel plant yard in which numerous railroad tracks have been laid for handling the scrap. From these scrap piles the material will be taken to the open-hearth furnaces as needed.

A 1000-ton steam hydraulic shear has been purchased by the company for use in cutting up the large superstructure and bottom sections and this will be erected shortly. From this shear the material will go into the open-hearth charging boxes. The large sections that are being placed on the scrap piles will be reloaded on cars and from these cars an overhead crane will place the scrap on a large conveyor 8 ft. wide which will deliver it to the shear.

#### Salvaged Material Being Used by Ford

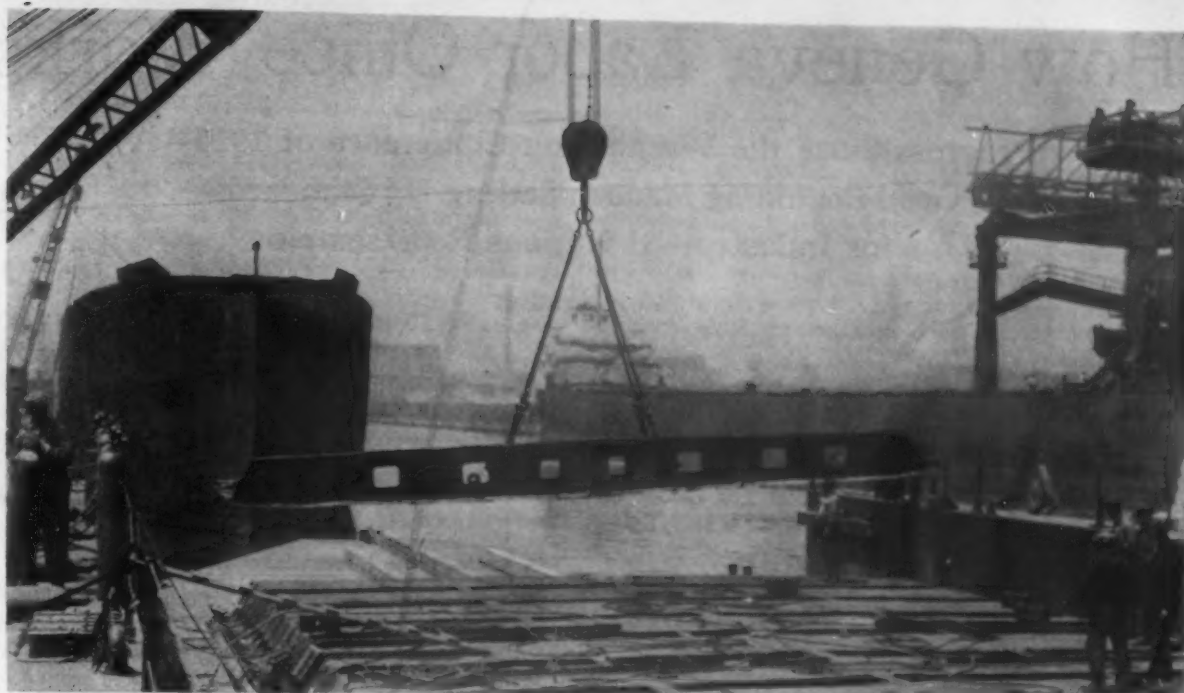
The Shipping Board's contract for the sale of the boats stipulated that none of the salvaged material could be sold by the Ford company but must be used in the Ford industries. The bulk of the salvaged material is being put to use and it is expected that a way will be found for the utilization of everything before the job is completed. Some is now being stored because no use has as yet been found for it in the Ford plants.

The lumber, after being stripped from the boats, is removed in bundles and workmen pull out all nails which are saved for scrap. Then they place the lumber on power-driven conveyors, which deliver it to an ad-



A ship bottom on the dry dock ready to be cut up into sections





*A section of the ship bottom which after being cut off is being hoisted from the floating dry dock. This is the last stage in the scrapping operation of the boats at the Fordson plant*

joining building where it is re-sawed and the salvaged lumber is sent to the company's box factory for making standard size boxes in which to ship car parts.

Among the salvaged equipment, pumps are one of the most important items, as a use is found for large numbers of these. Other boat equipment that is salvaged and re-used includes water heaters, boilers, tanks and winches. One of the engines has been reconditioned and installed in the plant for experimental purposes, being hooked to a 1000-kw. generator. Fittings and pipe are salvaged, much of the latter being cut up to make nipples.

Concrete that is poured in the bottom of the boats during their construction is broken up and used for

ballast for roads around the Fordson plant. Magnesium recovered from insulated pipes used in the refrigerating systems is ground up and mixed with binder to make material for patching pipe covering. The steel deck cabin known as the Texas is found to make a good tool crib. Hawsers no longer fit for use are made into twine for wrapping packages, the work of converting this worn-out rope into useful material being done by cripples and other incapacitated men.

Requisitions from various departments for equipment and supplies go to supply department heads who have lists of salvaged material and if the material wanted is available in salvaged stock, it is used in place of new material and is reconditioned as needed.

## PETROLEUM SUPPLY

### International Conference on Bituminous Coal, Nov. 15-19, to Discuss Fuel Oil at Car- negie Institute of Technology

The International Conference on Bituminous Coal, to be held at Carnegie Institute of Technology, Pittsburgh, Nov. 15-19, will consider the problem of the waning supply of petroleum for fuel, as shown in the recent report of the Federal Oil Conservation Board. Three exponents of the manufacture of fuel oil from coal, Dr. Friedrich Bergius and Prof. Franz Fischer of Germany and Gen. Georges Patart of France, will attend the conference.

Doctor Bergius is best known as the inventor of the Bergin method of the production of oil from coal. Professor Fischer is director of the Institute of Coal Research at Mulheim-Ruhr, and General Patart, who was in charge of the manufacture of explosives during the war, is the inventor of a process for making methyl alcohol from coal.

The program for the meeting will include the discussion of the manufacture of substitutes for gasoline from coal, complete gasification of coal, high temperature distillation, low temperature distillation, coal tar products, power, smokeless fuel, fertilizers, etc. The conference, President Thomas S. Baker of the Carnegie Institute points out, will be concerned chiefly with the best methods of the utilization of coal and with the discussion of new ways of employing coal.

Other speakers will include Dr. C. H. Lander, director of fuel research of the Department of Scientific

and Industrial Research, London; Dr. R. Lessing, consultant in fuel technology, London; Geoffrey M. Gill, consulting engineer and gas specialist, London; Harald Nielsen, inventor of the L and N Process, London; Marius R. Campbell, United States Geological Survey, Washington; A. C. Fieldner, chief chemist, United States Bureau of Mines; C. J. Ramsburg, vice-president Koppers Co., Pittsburgh; S. W. Parr, professor of applied chemistry, University of Illinois; H. A. Brassert, H. A. Brassert & Co., Chicago; Clarence B. Wisner, Carbocite Co., Canton, Ohio; Dr. Walter Runge and Henry Kreisinger, International Combustion Engineering Corporation, New York; and O. P. Hood, chief mechanical engineer, Bureau of Mines.

Claiming that standard specifications for steam quality are needed by the engineer buying steam and that the "commercially dry" standard now in use is indefinite, the Andrews-Bradshaw Co., 530 Fourth Avenue, Pittsburgh, has issued standard specifications, which it recommends for general use. "Samples of condensed steam shall show not more than nine parts total solids per million. . . . Steam shall be free of moisture. Throttling calorimeter tests at any time shall show a variation of not more than 0.2 per cent dryness."

The purpose of business organization, its common defects, and the importance of correct organization are discussed in a 24-page leaflet issued recently for general distribution by the Policyholders' Bureau of the Metropolitan Life Insurance Co., New York, entitled, "Piled Lumber or an Organization."

# How Geneva Labor Office Works

Progress Since the Washington Conference of 1919—A  
Good Beginning Made in Setting Up Standards  
for Industry—31 Nations Represented

BY JOHN CALDER

**A**FTER laborious weeks this summer, inspecting the industries of five European countries, conferring with employers and workers and managing officials, and with government departments concerned with industry, certain impressions not hitherto recorded in these articles to *THE IRON AGE* remain to be set down in this, the last of the series. Briefly, these are:

That the world is getting smaller year by year and that, even for us, economic isolation is now impossible.

That purely self-regarding nationalism and industrialism are two of the world's greatest curses.

That the relative conditions of labor over what is now pre-eminently an industrial world determine in the long run the attitude of nations to each other and their internal weal or woe.

That a "coal war" or a "steel war" or a war over raw materials essential to basic industries in any land can just as surely starve out a country unable to produce its own food and vital necessities as any physical conflict with modern lethal weapons. The difference is only that between a long drawn-out agony and a speedy, violent end—the latter probably the more merciful.

*Such wars are now on*, though the European steel pact which we predicted here a few weeks ago may, if ruled by statesmanship, tend to mitigate over-production of coal and steel in western Europe.

## The European Mind on America

Some Americans always see the term "international" in red letters. It is to them an infamous word. Their complex about it borders on profanity and rarely rises above stupidity. They feed their minds on the reports of paid workers whose business in life is to keep alive, regardless of truth and proportion, a good "red" scare all over our country on general principles. Some of our not wholly desirable, well-placed citizens have found it very handy as an alibi when detected in unsocial conduct.

These people who live on slogans with no sense of relativity are to be found in Pullmans as well as in day coaches. In Europe they were to be found everywhere saying: "What have *we* to do with the rest of the world? Let us eat and drink and be merry 'over there' and then 'forget it.'" And they did.

Such are some of our joy-riding, carefree, extravagant countrymen—a small minority of the whole—who trod roughshod over some sore spots in Europe this summer among nations in grave distress. The latter didn't like it; a few, a very few, of their less courteous nationals expressed this in word and deed in a corner of France when we were there, but the reports were greatly exaggerated.

Everywhere abroad one sensed, nevertheless, an undercurrent of impatience with the nationals of a prosperous, exuberant people, never, I believe, less conscious of antipathy to Europe and yet never less liked on that Continent. The feeling is not of yesterday; it is cumulative. It is a case of raw nerves ready to be set on edge. It is not defensible on any logical grounds, but it is understandable, and we believe it would disappear if we showed a becoming neighborliness and

sympathy. It will not be cured by gifts of gold or advice—only by really *caring*. But we can only care when the word "international" has for most of us a social-minded connotation, as it already has for those worthy Americans who are giving their thought, their means and their moral influence and talents to the Geneva experiment.

## Why the International Labor Office?

In the previous seven articles we have shown that, since the war, what is known in Europe as the "sweated" labor of a new, intensive industrialism in some of its states, aided by greatly improved transportation between countries, has brought fresh rivals into the markets in lands where labor conditions are relatively good and where the working day is reasonably short. Such manufacturers and countries complained after the war, and with truth, that they would not be able to maintain their labor standards unless some plan was made to protect them from the unfair competition based on human suffering which oppressive labor conditions always imply.

But these conditions the world over must be verified, compared and made known; must at every advance be secured by statute to those who have them, and be urged upon the attention of the less enlightened or less privileged. This is an international task; but who is sufficient for it? Certainly not the government or legislature, the strictly self-regarding manufacturer or factory worker or their federations in any single nation. The fact is that until the International Labor Organization with its Geneva office was created by the League of Nations there was no neutral agency in existence anywhere to compile the social, economic and industrial data of the world, make the proper comparisons and inferences and circulate them.

## Geneva Work Should Be Better Known

In the most advanced countries, of course, there were excellent statistical industrial bureaus, both government and commercial, for the data of their own lands but their very excellence has tended to retard interest in the world-wide survey now being conducted. A splendid beginning, however, has been made at Geneva which is too little known in detail and too slightly regarded by some otherwise estimable American employers to whom the name "International Labor" is sufficient to condemn a project, even if our own Government's ostentatious detachment from the League did not foster a lack of interest.

The staff of the office impressed us with their ability, broad outlook and non-partisan attitude—a most essential requirement in a body of employees hailing from 31 different countries. Probably no single office has existed anywhere of that complexion and it says much for the administration of both the League and Labor offices that effective cooperating groups have been attained.

## Plan of Organization

The International Labor Organization was born out of the new ideas of social justice and material interest which influenced the Peace Conference to make an or-



ganized attempt to get the civilized governments of the world to find common standards of living and labor for their workers, which would protect their citizens against the unfair competition of low standard industry wherever it might occur. Its object is to encourage and procure the making of international agreements to get rid of social and industrial abuse, and to equalize conditions throughout the countries of the world.

Started at Washington late in 1919, the International Labor Conference provided for a yearly meeting. In 1920 it was held at Genoa and in the same year the International Labor Office, housing the International Labor Organization, was set up in Geneva in accordance with Part XIII of the peace treaty. Since then all annual meetings of the conference have been held at Geneva, where it has now convened six times—usually about three months prior to the annual September assembly of the League of Nations. The council of the latter is its cabinet, meeting on fixed dates at least four times a year. The extensive organization of the latter's office with the governments of 55 nations in its membership, each sending three delegates to what is virtually an international parliament, calls for no description here.

It may be said in passing, however, that spectacular incidents once a year at the assembly, fully reported sometimes over-reported by the world's press, are no criterion of the valuable, painstaking work the year

tional parliament has a composition wholly new in international affairs. It includes not only representatives of the same 55 nations as are in the League, together with Mexico, but also representatives of the organized workers and of the organized employers in each country. These representatives are leaders of the workers' unions and employers' federations, and through their presence the general conference has the benefit of the specialized experience and knowledge of those who will be most concerned in carrying out the new national laws in which the treaties negotiated must result. In this way the conference can avoid technical mistakes, and their share in preparing the treaties of betterment usually assures the good will of the leaders of both workers and employers. It was the testimony of those who have participated that these workers' and employers' representatives never depart without leaving some of their prejudices behind and visioning more fully the problems and the troubles of "the other fellow."

#### Procedure in the Conference

The delegates to the general conference divide into groups which are united, not by national or geographic ties, but by common international interest. After debates the workers' group and the employers' group usually, but not invariably, vote collectively. The government group, which is twice as numerous as the two

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*THIS is Mr. Calder's eighth and final article giving results of his investigations into industrial conditions in Europe as a member of the American Management Mission of last summer. After visiting five countries he went to Geneva to learn of the aims and actual accomplishments of the International Labor Office, with a staff representing thirty-one countries. He found much to commend in this neutral agency for compiling and circulating the social, economic and industrial data of the world. In the general conference the workers' group and the employers' group usually, but not always, vote collectively.*

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round with which the able League staff and its corps of experts and researchers must be credited. We desire to outline rather the very real service which one of the League's creations—the International Labor Office—is increasingly fitted to render to employers and workers throughout the world—a service which the latter should more fully utilize, appreciate and acclaim.

#### The General Conference

When we visited Geneva in August the handsome new International Labor Office on the shores of the Lake of Geneva had been occupied only a few weeks, but had already settled down to a well-planned routine in quarters where it had, for the first time, elbow room. The staff of the International Labor Office do for their organization the same work which the secretariat do for the League. The governing body, or cabinet, corresponds to the council of the League and, like it, meets every quarter. At this office the program of the annual general conference—which corresponds to the League's assembly—is prepared and here the office staff of varied experience and talents have their translators, interpreters and typists, and their own rapidly growing library, as well as all equipment for economical and satisfactory work.

The International Labor Organization, though the creation of the League and supported by its funds, is an independent body in the sense that its policy is not controlled by the council or assembly of the latter. Special representatives of the various governments act directly in its governing body or its general conference as the case may be. The chief of the bodies which make up the International Labor Organization is the general conference. This second and lesser interna-

former, is thus left as the strongest power in the conference, and can decide, as it rightly should, between the conflicting claims of employers and employed.

This does not mean that the government delegates can do exactly what they like in any case, for these delegates are often not agreed among themselves and the workers' and employers' groups can thus decide the action which the conference takes. No government is forced to accept a labor or commercial or social conditions treaty which it does not like, but it is obligated to give its own national parliament an opportunity to debate any draft convention which the conference has adopted by a two-thirds vote of all its members. Thus the unofficial delegates, workers and employers, have real power to influence not only the conference discussions at Geneva but the consideration of progressive changes in national parliaments throughout the world.

#### The Governing Body

As has been said, the governing body corresponds to the council of the League and is virtually the cabinet of the International Labor Organization. It is larger than the League council, having 24 members against the council's 10. An examination of its personnel shows the high type of men which the nations select for this honor. It controls the office director's work, debates his budget, and in other ways acts as an international cabinet within its separate sphere.

#### Results Attained

The general conference has considered many social, health and industrial questions of international character. It has already adopted over 20 "conventions" and as many "recommendations." Every convention

has been ratified by some countries; none has yet been made legally binding in all of the 55 nations involved. That is too much to expect from an effort barely seven years in existence, with a large part of that time spent in organization, accumulation of facts and research.

On all the varied questions an examination shows that the general conference has produced as the joint effort of worker and employer, practical experts and government delegates, sound workable proposals which are steadily becoming the accepted law of civilized states. This has not meant great change in countries where social, economic and industrial conditions are comparatively good; but the record shows that it has meant great change for good in countries—mostly in southern Europe and in Asia—where conditions have been bad. Much remains to be done, but already the industrial nations of the west have been relieved from some of the unfair competition from "sweated" Asiatic labor. Shocking conditions under which children of tender age have worked in Persia, China, Japan and India have been very much improved.

#### The Future

The hopeful thing to an American observer about the International Labor Organization is the cautious, solid start it has made, the sound and efficient institutional machinery which is in evidence and the high caliber of the scientists, economists, sociologists and

practical men of affairs who head its departments and services. The true importance of the institutions of Geneva, which some Americans, who care for none of these things, still affect to despise or to give only a contemptuous tolerance, lies not in what they are today but in what they will become.

If the Permanent Court of International Justice, for instance, is never to have a wider jurisdiction than it has today, if the time never comes when it is entrusted with disputes about the most vital of national interests, its place in future history will be small. If the mandates system or the International Labor Organization here described are judged by their actual achievements to date, they cannot be held to have made great changes in the social conditions of the world.

But to judge the new institutions in that way is to miss their meaning entirely. To understand them we must think of them as bodies set up, for the first time in history, to deal with branches of human relationship between men of nearly three-score different nations in which there is vast scope for international action, and great danger if such international action fails. We must think of them as institutions founded on new and vital principles, which already justify the hope that they will so develop as to give to these principles whatever application the evolving social and economic needs and conscience of mankind may from time to time demand.

## LABOR TURNOVER CURTAILED

### Results of Cooperation with Workers in Bethlehem Steel Plants

What the Bethlehem Steel Corporation has gained through establishing cooperation between men and the management is discussed at some length in the *Bethlehem Review* of Oct. 15, a news bulletin issued for the employees of the Bethlehem subsidiary companies.

It appears, for example, that against a fluctuation of 50 per cent from the average for the high and low points of employment in 1921, the fluctuation in four years has been reduced until in 1925 the high and low point varied barely 10 per cent from the average for the year. Labor turnover was 135 per cent in 1923 and 67 per cent in 1925. The increase in average yearly earnings per employee is indicated in the figures for the average number of days worked per year per employee; in 1919 it averaged 241 and in 1925, 293.

In the same connection the employees of the company were told that in the last 21 years they had received a total of \$1,115,000,000 in wages as their part of the income of the company, while investors have received for the use of their money \$81,000,000 in dividends and \$125,000,000 in interest.

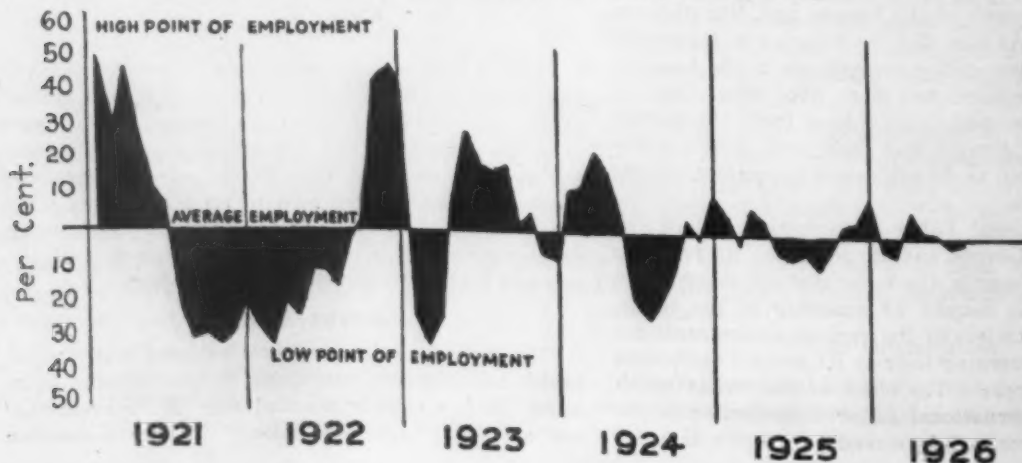
Also, they were told in the following quotation the result of economies of operating costs: "In 1925 the average prices received for steel products were \$5.85

a ton less than in 1923, but due to the reduction of \$5.12 per ton in operating costs the corporation's net operating profit for 1925 was only 73c. less per ton than in 1923, even with the latter's advantage in prices."

The prominent features of the cooperating plan include employee representation, provision for stock ownership by employees, pension plan on retirement, relief plan for the sick, aid toward home ownership, and a program of accident prevention and first aid work.

### Bridgeport Industrial Activity Continues High

Industrial activity at Bridgeport, Conn., based upon the number of employees and the number of man-hours worked, showed an increase in the week ended Oct. 23. The number of employees was 13,643, or 80 per cent of the normal number, as estimated by the 31 factories contributing data as of Feb. 1, 1926. This is the highest percentage since the week ended May 15, and shows an increase of 0.4 per cent over last week. The number of man-hours worked for the same period was 665,014, or 79.6 per cent of normal, the same as in the previous week, and representing the highest percentage since the week ended April 17. The average number of hours worked per factory was 49.6 per cent, or 101.2 per cent of normal, an increase of 1 per cent as compared with the preceding week.



*How the Swings of Employment with the Bethlehem Steel Corporation Have Been Lessened Notably in Later Years Is Here Shown*





# First Coke Furnace in the Bay State

Features of the Plant of the Mystic Iron Works at  
Everett, Mass.—Foreign Ores and By-Prod-  
uct Coke from Pocahontas Coal

**I**N the article in *THE IRON AGE* of Sept. 30 telling of the blowing in of the blast furnace of the Mystic Iron Works at Everett, Mass., just outside of Boston, only general reference was made to the mechanical features of this new plant. It is now possible to present a more detailed description together with a plan and several illustrations.

The furnace company is one of the enterprises of the Massachusetts Gas Companies, a corporation which has long owned, at Everett, a peninsula of 325 acres between the Island End River and the Mystic River. The first plant built on this peninsula was a battery of by-product coke ovens operated by the New England Fuel & Transportation Co. These were added to from time to time, and the company now has 400 United Otto coke ovens, in addition to which 51 Wilputte ovens are under construction for the coke supply of the new fur-

nace. The Mystic Iron Works site consists of 65 acres fronting on the Mystic River.

Over two years were required for construction work; one year for dredging the channel and filling the furnace site. About 700,000 cu. yd. was dredged from the bed of the Mystic River to a depth of 30 ft. below mean low water, giving a channel 200 ft. wide and 2100 ft. long. The ore storage yard was formerly a marsh area which has been filled in with sand and gravel to a depth of 26 ft., bringing the grade of the ore yard 17 ft. above mean low water, so as fully to protect the ore from salt water. The wharf is 320 ft. long, of concrete on heavy oak piles 50 ft. long.

Three unloaders, with buckets of  $4\frac{1}{2}$  tons capacity, lift the ore and limestone from the ships (the ore carriers being of 10,000 tons capacity), and discharge it into a 10,000-ton concrete bin on the wharf. The



Base of Blast Furnace Stack



Gas Cleaning System

unloader drops the ore into a hopper from which it is fed on a 36-in. belt, being weighed on a weightometer before it is delivered into the ore trough. The ore bridge has a length over all of 450 ft. and a clear span of 250 ft. The bridge has an 8-ton bucket and an hourly capacity of 450 tons. The speed of the bridge bucket is 750 ft. per min.

On the blowing in of the furnace the ore yard contained 120,000 tons of foreign ores in four piles, two of African ores, one of Swedish and one of Newfoundland. Coal comes from the Pocahontas field, the company's own barges carrying it from Virginia port. Limestone is brought from Rockland, Me.

The stock bins are of the usual construction. Those for ore and limestone are filled by a transfer car loaded by the bridge. Coke is brought from the coke oven plant in trainloads, the coke trestle incline being 1600 ft. long. Scale cars automatically weigh the ore, limestone and coke before their delivery at the skip hoist into two 10-ton skip buckets. The latter alternately carry their load up the 125-ft. incline, discharging it into the top of the furnace, which is equipped with revolving device.

The plant was built on the designs of the Freyn Engineering Co., Chicago. The blast furnace is 88 ft. high, with a bosh diameter of 22 ft. 6 in. and a hearth diameter of 17 ft. It has a  $\frac{3}{4}$ -in. steel shell and is lined with 3 ft. of fire brick. The furnace shell is set on 12 solid 20-in. cast iron columns, and there are 10 tuyeres. Bustle pipe diameter is 36 in.

The three stoves are each 22 ft. in diameter and 105 ft. high, and the stove chimney is 225 ft. high and 7 ft. top diameter. Air under 12 lb. pressure is blown through the stoves at 45,000 cu. ft. per min. and is heated to 1300 deg. Fahr. as it goes to the furnace stack. The gas washing equipment consists of a dust catcher 20 ft. in diameter, a washer and dryer, and in the third place a heat exchanger, which is a boiler-shaped device 12 ft. 6 in. in diameter filled with 8-in. tubes. All the waste gases of combustion in the stoves are run through the heat exchanger around the outside of the 8-in. tubes on their way to the chimney. The fresh gas from the gas washer passes in the opposite direction through the 8-in. tubes in the heat exchanger, its temperature being raised and its moisture reduced.

The gas from the furnace goes first to the dust

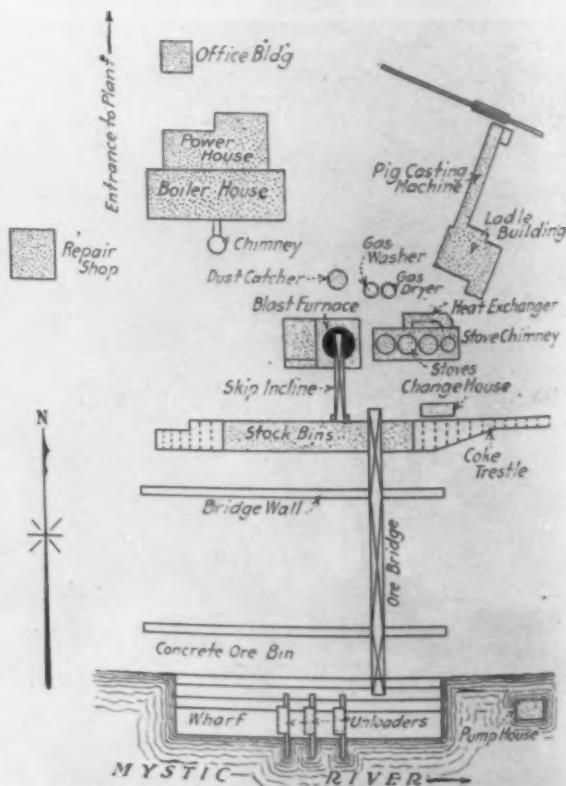
catcher, where the dust is separated out by baffle plates and specific gravity, and is drawn off from the bottom of the dust catcher. It then passes through the washer, which is filled with wooden grids sprayed with fresh water to take the remaining dust from the gas. From the washer the gas enters the dryer, where most of the moisture is separated out. The dust catcher operates through convolutions. The dryer operates by changing the direction of the gas. The gas to both the stoves and the boiler house goes through the entire gas cleaning and drying system and the heat exchanger, but there is an alternative emergency gate valve which would make it unnecessary to wash the gas for the boiler house.

The boiler house has six 800-hp. boilers, of 225 lb. pressure with 125 deg. superheat. They are arranged to burn blast furnace gas, bituminous coal and coke breeze. Furnace gas is about 125 deg. when delivered at the boilers. Ashes from the boilers are hopped and dumped into railroad cars in the basement of the boiler house. The design of the boiler house is to burn all the blast furnace gas not required for the stoves, and the coke breeze from screening the blast furnace coke, and also the coke breeze from the coke oven plant. It will supply steam not only to the blast furnace plant but also to the coke oven plant through a 10-in. main 3000 ft. long. The boiler chimney is 225 ft. high and 14 ft. top diameter.

In the power house are two turbo-blowers, each of 5000 hp. at 4600 rev. per min., each delivering 45,000 cu. ft. of air per min. up to 30 lb. pressure. The weight of the turbo-blowers is about 50 tons. Reciprocating engines would weigh about ten times as much. One of the old type reciprocating engines would require the entire floor area of the power house. The turbo-blowers condensing develop 90 per cent of possible vacuum. The air compressors compress 3000 ft. of air per min. to 100 lb. pressure for use as auxiliary to bells, etc.

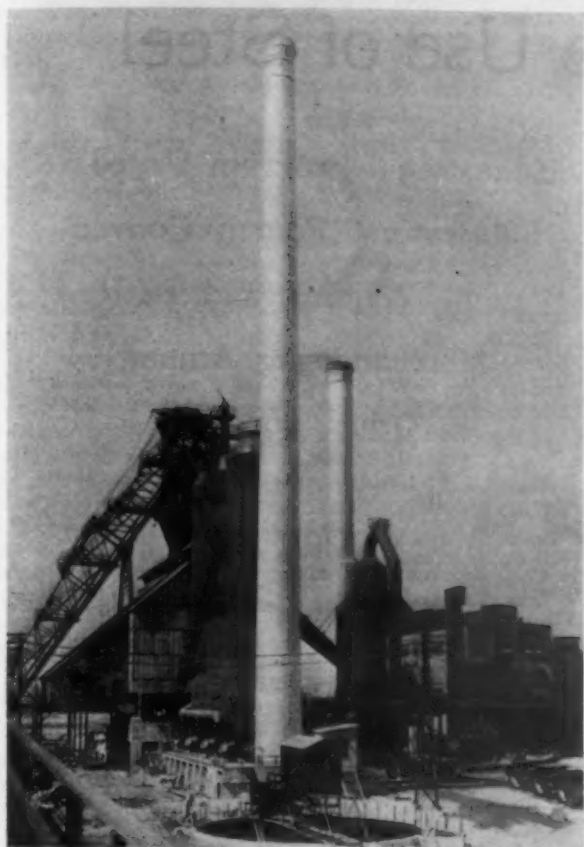
There are two turbo-generators of 750 kw. at 3600 rev. per min. for 2300 volts a. c., and two 500-kw. motor generators for 250 volts d. c. In the basement of the power house are the boiler feed pumps and feed water heaters, and the pumps circulating the salt water to the turbo-condensers and to the gas washing system and to the cooling pipes of the furnace.

The salt water is drawn from the Mystic River by three motor-driven pumps with a total capacity of



Arrangement of Mystic Iron Works Blast Furnace Plant at Everett, Mass.





*Skip Hoist, Furnace Top and Stoves*

9000 gal. per min. The pumps are located on the edge of the channel and set below the level of the river water.

Hot metal ladles convey the molten iron from the furnaces to the ladle house, where they are lifted on their trunnions by an overhead crane, and by tilting the metal is poured into the molds of the pig casting machine. It moves along under water spray that cools and solidifies it into pigs before it is dumped into freight cars. The pig machine has two strands, each of which molds 24 pigs, or 2400 lb., per min.

### Establishes the Walworth California Co.

The corporate name of the Walworth Co.'s California subsidiary has been changed from the Walworth-Lally Co. to the Walworth California Co., the change being effected as a result of the retirement from the organization of H. T. Lally.

Prentiss L. Coonley, first vice-president Walworth Co., in charge of sales, has been made president of the Walworth California Co. E. A. Neupert, formerly active head of the Walworth Oregon Co., has been made vice-president and general manager of the California company. G. A. Ricker is secretary and assistant treasurer and W. M. Mickleborough treasurer. Howard Coonley, president Walworth Co., is chairman of the California company's board of directors, which includes P. L. Coonley, Mr. Ricker and Mr. Neupert.

Headquarters of the Walworth California Co., a Nevada corporation, are at San Francisco. Branch houses of the former Walworth-Lally Co. at Los Angeles, Oakland, Stockton, Fresno, Sacramento and San Jose will be maintained by the new organization. The Fresno branch has taken over the Midstate Pipe & Supply Co., a Fresno subsidiary of the Shinn-Holtz-Lyon Co., Los Angeles, until acquired by the Walworth Co. The Walworth California Co. originally was the Mark-Lally Co.

The Old Colony Foundry Co., East Bridgewater, Mass., has closed for an indefinite period on account of anticipated labor troubles, and has let its work under contract to outside foundries.

## VISITS BRITISH STEEL MEN

### Steel Treathers' Secretary Meets Metallurgists— Some of His Impressions

*(Special Correspondence)*

LONDON, ENGLAND, Oct. 22.—William H. Eisenman, secretary of the American Society for Steel Treating, passed through London this week. He is visiting Europe. On the day of his arrival in London, Mr. Eisenman met Sir William Larke, H. S. Primrose and others and exchanged views regarding conditions in the United States and in Great Britain. He also met G. C. Lloyd, secretary of the Iron and Steel Institute, and G. Shaw-Scott, secretary of the Institute of Metals. He visited Sheffield, where he was given an insight into the industrial conditions prevailing in the "steel" city.

#### Steel Treathers Well-Known in England

Mr. Eisenman was agreeably surprised to find that the work of his society was so well known in England. Indeed, to such an extent was interest aroused, in a large measure due to reports published in THE IRON AGE, that suggestions were made to Mr. Eisenman in favor of the formation of a chapter of the society in England. Mr. Eisenman held out no hope of material support for this movement from his directors, and in view of the large number of metallurgical and engineering societies already in existence in England, it is doubtful whether adequate local support would be forthcoming to justify an increase. Nevertheless the work of the American Society for Steel Treating has already aroused sufficient interest over here to warrant the belief that the subjects which come under its purview will be given far greater attention by British societies than they have received in the past.

#### British Societies May Visit America

Shortly before his departure from London, Mr. Eisenman said that he was well pleased with the cordial reception extended to him by steel men. He was particularly glad to have made personal contact with the secretaries of our leading metallurgical institutes, with each of whom he had long interviews. Mr. Eisenman was able to suggest that a visit by the Iron and Steel Institute or the Institute of Metals to the United States would be welcomed by American metallurgists. The suggestion was of course entirely unofficial, but it would occasion little surprise if it resulted in the holding of a fall meeting in America within a few years.

#### Cooperation Between Industries and Institutions

One feature which impressed Mr. Eisenman was the close cooperation between the industries and the technical training institutions. This was particularly noticeable in Sheffield where in many instances actual training in a works constitutes part of the educational curriculum.

The system of apprenticeship in England struck Mr. Eisenman as being in advance of that in the States where apprentices are taken only by comparatively few large companies with a view to being trained for positions in those companies. In England, however, the close cooperation between the university or technical school with the industries of the district results in the student-apprentice securing a well-rounded education in addition to actual experience.

It was somewhat of a novelty also to notice the night courses at technical schools for day workers. Unlike similar courses in America, where the instruction is general, in England such courses cover the specific occupations in which the workers are actually employed. In visiting works research laboratories, Mr. Eisenman was impressed by the fact that the research workers were not merely engaged in investigations covering the products of the particular works but were enabled also to carry on scientific research not directly associated with production activities. Mr. Eisenman found that in England the metallurgist and the metallurgical departments were highly regarded and that generally the remuneration of metallurgists was higher than in America.

# To Promote the Use of Steel



Educational Program Urged at  
Fabricators' Fourth Conven-  
tion—Welding and Better  
Merchandising Among  
Other Topics

**T**HE advantages of steel as a structural material and the necessity of organized promotion of the use of steel for construction purposes might be said to have been the two outstanding themes of the fourth annual convention of the American Institute of Steel Construction, held at the Greenbrier, White Sulphur Springs, W. Va., Oct. 26-30. A session was devoted to the possible application of welding in the structural field, and brief reference to this application of welding was made in addresses at other sessions.

There was an unusually full program consisting of more than 15 addresses and papers, five formal reports and a number of elaborate social and recreational events. The registration was in the neighborhood of 300 and included 100 ladies. The program as a whole was of high caliber and all sessions were well attended. W. M. Wood, Mississippi Valley Structural Steel Co., Decatur, Ill., was elected president to succeed J. L. Kimbrough, Indiana Bridge Co., Muncie, Ind. C. Edwin Michael, Virginia Bridge & Iron Co., was elected first vice-president, and C. M. Denise, McClintic-Marshall Co., second vice-president. George E. J. Pistor, Hay Foundry & Iron Works Co., is treasurer. Six new directors were elected as noted on another page.

In addition to papers presenting data on the strength, security, reliability and permanence of steel as a structural material, addresses were made on fire-proofing, architectural design of steel bridges, economies in steel construction and research investigations in the structural steel industry. A feature was an address on salesmanship and merchandising.

#### Seek Cooperation from the Mills

**R**EFERENCE was made by several speakers to the desirability of participation by rolling mills in the institute's educational campaign to promote greater use of steel. On this, the opinions expressed seemed to be the same as that of one speaker who said: "Certainly it is obligatory upon all producers to contribute a just share of the cost of any and every intelligent and effective method to increase the consumption of their product." More specific was Executive Director Abbott, who in this report, in discussing mill relations, said in part: "All of these facts make it clear that mills could well consider extending their present cooperation to include the initiation of a broader educational campaign featuring the advantages of steel for construction purposes, the preparation of text books, motion pictures, and other material for use in technical schools, and the organization of educational meetings to be attended by those upon whom rests the decision as to whether steel or some other material shall be used."

Competition from rolling mills was also brought up during the meeting. One speaker held that the mills should recognize that where local fabricating

companies have competent organizations and equipment to serve their respective communities, that their competition should be limited to other fabricators desiring to serve that community. "They are frequently discouraged to find their market demoralized by competition from the rolling mills," this speaker said. "Local distributors of other commodities are not subjected to such competition." It was also regarded as unethical for rolling mills to sell their products for shipment from the mills to consumers in a given territory where fabricators carry stocks, at the same or a lower price than charged the fabricator, who buys in wholesale quantities for distribution in that territory.

J. L. Kimbrough, Indiana Bridge Co., Muncie, Ind., president of the institute, in his address opening the convention said: "It is an unfortunate fact that the mills have always dominated the structural steel market through their large fabricating plants. It is a situation that is economically unsound and has militated always against constructive development of the fabricating industry. This mill domination and accompanying indifference to the problems of marketing structural steel is responsible for the shrinkage of fabricated structural steel from the market within the past two years.

"The competition of the hot steel industry with its logical distributor of structural shapes has unquestionably discouraged the efforts of the individual fabricator and retarded the development of the structural steel industry," said Mr. Kimbrough in another part.

#### Marketing, a Basic Problem

**M**ARKETING, which contemplates publicity, advertising, and merchandising and selling, was said by Mr. Kimbrough to be the great problem confronting the steel industry. "It is my opinion," he said, "that the consumption of fabricated structural steel can be increased by aggressive action in developing new markets. It is a fact that the reinforced concrete interests through their activities are displacing approximately 1,000,000 tons of structural steel a year in what is conceded to be our logical market. This situation has been brought about more largely through publicity than any other factor. We can and should reclaim this market."

United action in preaching the advantages and ultimate economy in the use of structural steel was also stressed by C. Edwin Michael, president of the Virginia Bridge & Iron Co., Roanoke, Va., in an eloquent address at the opening session.

Plans are being completed for the inauguration early next year of an educational advertising campaign in the leading publications reaching architects, engineers, building owners and business executives,



said Executive Director Abbott in his annual report, published in part in THE IRON AGE of Oct. 28, page 1213.

#### New Members Announced

Four new members announced at the opening session were: Topeka Foundry & Machine Co., Topeka, Kan.; A. O. Wilson Co., Cambridge, Mass.; Grainger Co. and Louisville Bridge Co., both of Louisville, Ky.

#### Stresses Need of Better Merchandising

**A** FORCEFUL address on "Salesmanship and Broader Markets," by E. St. Elmo Lewis, sales and merchandising counsellor, Detroit, was received with interest.

In explaining the difference between selling and merchandising, Mr. Lewis said: "To me, selling means the act of making a sale and the methods and policies that effect the relationship of the salesman to his product and his customer. Merchandising is all of this, and more. It relates to the whole process from buying the raw material, making the article for sale, pricing it, selling it, delivering and collecting for it—every process being governed by the needs or wants of the buyer, the maker having constantly in view obtaining the greatest possible volume, with the maximum profit in money, good will and business-building results.

#### Some Fallacies Regarding Buying Public

We sell to a public, said Mr. Lewis. That public is a peculiar thing. It is busy, indifferent, and exacting. We know less about it than we should. We know, however, some fallacies held regarding it. "Among these fallacies are: That the public will automatically seek the best. It has to be educated and directed. It is a fallacy that the public knows the difference between price and value; that it will automatically reward enterprise and service; and that it knows what it wants. It is a fallacy that the public will demand over any great length of time what it is not reminded of." Therefore we have salesmen and sales departments and educational advertising methods, said Mr. Lewis.

In the part of the address devoted to "what is the steel fabricator's problem?" the institute was commended for its fine beginning toward remedying some of the fundamental-data needs for the equipment of members' sales organizations. It was pointed out that organized education of the market and possible markets is needed to efficiently overcome resistance. Using salesmen as advertising is too costly.

Research on present and future markets was also taken up, it being pointed out that the past and present market affords an opportunity to study tendencies and realizations against opportunities. "Contacts must be made, it seems to me," said Mr. Lewis, "at an earlier date with the jobs in the making. More intensive educational work, of a technical nature, must be developed, with the architects and engineers, commissions and contractors. The national advertising program will offer a background for this, and at the same time seek out and inoculate the men who will be on committees, commissions and the owners of tomorrow, and that great body of unidentified, unknown managers, superintendents, assistants, who cannot give an order but can help or hinder with opinions."

The institute's research, it was pointed out, must look into the future for potential markets. "The new markets are, to say the least, in your industry vastly interesting," said Mr. Lewis. "THE IRON AGE articles, the recommendations of Grosvenor Atterbury to the New York State Housing Commission, and activities in other directions point conclusively that steel is going to be used in a greater degree than ever in the residence field. Now is the time to get into the house field. Get your data together; teach your salesmen; organize your territories, and prepare your advertising."

"Hasn't the dominant idea in the steel fabrication plants been one of production? How many men have you on your staffs, thinking, planning, and testing new and better ways of selling—new and better ways of marketing, new and better ways of adopting your capacity to new requirements, researching to find new markets?"

In conclusion, Mr. Lewis said, in part: "Investigate future markets and take steps to guide them in your industry's interest. Change the basis of price so you can be paid for the service which is necessary to insure satisfied customers. Train your salesmen so that they will know more about your product in relation to its uses than the buyer. Make a part of your sales policy the utilization of all proved devices by which the maximum possible demand shall be maintained at all market levels.

"Tell the world what you are doing and what you have, in a way to make it realize its value."

#### More and Bigger Buildings and Bridges

**S**KYCRAPERS are an economic necessity and will continue to increase in height and numbers, said Lee H. Miller, chief engineer of the institute in the

### New Officers of the American Institute of Steel Construction

*President.—W. M. Wood, Mississippi Valley Structural Steel Co., Decatur, Ill. First Vice-President.—C. Edwin Michael, Virginia Bridge & Iron Co., Roanoke, Va. Second Vice-President.—C. M. Denise, McClintic-Marshall Co., Pittsburgh. Treasurer.—George E. J. Pistor, Hay Foundry & Iron Works Co., New York. Charles F. Abbott, 285 Madison Avenue, New York, is executive director.*



W. M. WOOD  
President



C. EDWIN MICHAEL  
First Vice-President



C. M. DENISE  
Second Vice-President



C. F. ABBOTT  
Executive Director

concluding section of his annual report, which was presented in abstract at the opening session. The bridges of America will also continue to increase in number and size, he said. In the future as in the past the construction of tall buildings and mighty bridges will be dependent upon steel. Steel alone makes possible their construction, since steel alone possesses that elasticity which enables it to sway or bend beneath load or impact and return to its original shape without impairment to its strength.

The growing congestion of traffic in the large cities will be solved, not by curtailing the height of buildings, but by the use of steel to relieve conditions for which high buildings are only partly responsible. Traffic bridges over crosstown arteries and second story sidewalks were predicted by Mr. Miller.

A considerable share in the promotion of the most intelligent and economical use of steel in building construction has fallen to the technical staff of the institute, under the direction of Mr. Miller. These activities embrace the encouragement of uniform and approved engineering practices; encouragement of research to widen the field of usefulness of structural steel; and contact with technical schools and with those in whose hands rests the decision as to the materials to be used in a given construction project.

#### Welding Proposed as Subject for Research

FREQUENT expression was given during the meeting to the necessity of research as the foundation for progress. The institute's technical research committee although handicapped by a lack of funds has drawn up a program, which was submitted in the form of a report by Aubrey Weymouth, Post & McCord, Inc., New York. The report said in part:

"Whatever doubt has existed in the minds of the

committee as to the most important problem to head a program of research has been dispelled by the industrial developments of the past year and a great popular demand. The announcement of the letting of a contract for the construction of a five-story building the steel work of which is to be entirely welded in the shop and field, has brought to light a tremendous interest by the public in this subject.

"Even if welding has proved its case as a physical possibility in structural work, it will be necessary to conduct comprehensive tests to determine standard types of welds for different kinds of stresses, and to develop data sufficient to place the designing of welded structural joints on a rational basis and to obtain acceptance of the general principles of designs and approval of the work by consulting engineers and the building departments throughout the country.

"The American Bureau of Welding has launched an investigation dealing with the application of welding to steel structures. Members of the institute have been asked to serve on this committee. To avoid duplication of effort and expense, it seems advisable for the technical research committee to cooperate with the welding bureau's committee.

"There is no doubt that there are possibilities here of the most revolutionary development in the structural steel business in the last 25 years. Designs may be radically changed due to the development of continuity in the lines of beams and girders, shop layouts and fabrication processes may be so changed as to result in greater production per man. So far-reaching is the idea that even our present mill practices may be materially modified due to a change in the character and shape of the material rolled.

"Wind bracing, fireproofing and corrosion were also recommended for research."

## Steel for Strength, Security and Reliability

COMPARISON of steel with other materials used in structures was made by Dr. George F. Swain, professor of civil engineering, Harvard University, Cambridge, Mass., in an outstanding paper on "Steel for Strength and Security." Reinforced concrete, it was held, has been and is being used in many cases where steel is decidedly preferable.

Steel it was pointed out, is a finished product, the result of years of experience, experiment and study. It comes to the work in its finished form, the product of years of experience by manufacturers, metallurgists, engineers, expert superintendents and foremen, and experienced workmen. It has in a higher degree all of the desirable characteristics of a structural material. It is exceedingly strong, durable if properly taken care of, elastic, resilient, tough, with great tensile strength, usable at all times, unchanging and reliable. It may have initial stresses, but they may be reduced or removed by annealing, so that practically they are not dangerous. It may be tested before being used. Each heat may be tested, or each piece, if desired. It may, of course, have defects, as every material may, such as seams, segregation, piping, but there are ways of preventing these and of finding out whether they exist. Magnetic and electrical tests are being used, as well as physical tests. The chemical composition can be accurately controlled.

"In a long structural experience," said Dr. Swain, "I have never met with a case of failure of a steel structure on account of poor material, though I know of one standpipe which failed from this cause; but the poor material could have been detected and rejected. Steel structures have failed, but almost always on account of poor design or overloading. If a steel structure fails, except from an accident, it is almost always true that the failure could have been predicted by a competent engineer after an inspection, and it almost always gives warning beforehand. This is not true of reinforced concrete."

Steel, it was further pointed out, does not change after it is put into a structure. It does not crystallize under repeated loads. It is subject, as all materials are, to expansion and contraction due to changes of

temperature, but, if statically determined, these need not cause stresses.

In comparing concrete with these qualities of steel, Dr. Swain stated, in part: "Concrete is a material made on the job, dependent on the quality of stone, sand, cement and water, the proportions, the care in mixing and placing, and much influenced by small variations in the quantity of water used. It sets after being placed beyond recall. Its ultimate condition depends much upon the curing, or treatment during setting, and the amount of water given it. It expands and contracts subsequently as it is wetted and dried. Is it not obvious that there must be considerable uncertainty in the resulting product? Modern methods of field control have made it easier to secure uniformity and good quality, but great lack of uniformity still exists."

Shrinkage stresses in reinforced concrete were discussed, and also the usual methods of computing reinforced concrete structures. Steel and concrete were compared in detail with reference to several desirable characteristics of a structural material, all of which are possessed by steel.

Among the other advantages of steel over reinforced concrete, which were mentioned, were the ease with which changes, additions, and repairs may be made; the possibility of removing a steel bridge to another place or of removing a steel building easily if the land should be needed for another purpose, and the fact that steel has some salvage value. Also, steel allows more space in buildings because the columns may be smaller. In bridges, concrete columns have sometimes seriously restricted traffic. The relative economy of the two structural materials was also discussed.

In his concluding remarks Dr. Swain said: "For a structure which can be made of steel or iron so as to be accessible for inspection and painting, I would much prefer steel to reinforced concrete. This includes railway and highway bridges, tanks and standpipes, stadia and grandstands, ships and barges, cars, etc." In re-

(Continued on page 1325)



# Simplified Practice Eliminates Waste

Increased Business Possible on Fewer Sizes and Specifications of Commodities, Says  
Speaker on New York Management Week Program—Metals Industries  
Profit by Commerce Department Plan

THAT the manufacture of many sizes, shapes and specifications of a product, when more business might be done on a comparative few, is one of the greatest wastes in the metals industries, was emphasized by H. Chattin Wetherill, director of metals utilization, Department of Commerce, in an illustrated address on Oct. 26 before the Metropolitan section of the American Society of Mechanical Engineers, New York, as a part of that organization's observance of Management Week, Oct. 25-30. The metals industries, Mr. Wetherill pointed out, are only 29 per cent waste, and even though this compares favorably with the general average of industry as a whole, which is 46 per cent, there is still much to be done if our metal products are to continue to hold their economic supremacy in the face of growing European competition.

## Simplified Practice in Reducing Waste

Mr. Wetherill cited specific instances where simplified practice, as the Department of Commerce has named the reducing of sizes, shapes and specifications of commodities, has been successful in eliminating waste in the metals industries. There were, he said, formerly 1819 different forms of sheet steel manufactured and carried in stock by producers. With the aid of the Department of Commerce's division of simplified practice the number was reduced to 261. It was soon found that more business was being done with corresponding increased profits made than before.

Similarly it was possible to reduce the number of sizes of metal lath from 125 to 24 with consequent increased profits. Nor was this saving confined to the manufacturer alone. The distributor was able to reduce his stocks, and do a greater business by increased turnover, and the consumer in turn was allowed to profit by the savings of both manufacturer and distributor.

## Why Three Grades of Concrete Reinforcing Bars?

The elimination of needless diversification is being constantly realized by other branches of the metals industry. There are at present three grades of new billet steel for concrete reinforcing, all specified by the American Society for Testing Materials, and it is known that all three grades are being used for the same purpose. The preference for their use under identical conditions has no other basis than personal choice in most instances.

The speaker told of a committee of the new billet reinforcing steel industry which is at present working on the problem of securing a unification in the specifications for this commodity. They have before them the possibility of the elimination of some of the existing specifications and an adherence to the remainder, or the recommendation of a new specification sufficiently broad in its limits to include a number of the existing grades.

If the committee should recommend to the industry that this latter course be pursued, and the industry should agree with its findings, the A. S. T. M. will be asked to reconsider its present specifications in the light of more recent findings. This committee, appointed by the division of simplified practice, will go no farther than this recommendation and attempts to bring no pressure to bear on the regulation of industry. It merely acts as an aid to industry in the solution of its problems. But as Mr. Wetherill pointed out, the various persons and associations concerned with the creation of specifications are usually very glad to cooperate, and the problem of pride in authorship is gradually disappearing.

"Modern constructive management," said Mr. Weth-

erill, "is based largely upon six considerations which have been derived from a recent referendum of 17 important corporations. They are: Control of inventory, increased cut in production costs, increased effectiveness of sales organization, close watch on general business conditions through a study of business statistics, increased simplification and elimination of needless variety, and budgeting of sales, production and finances.

"Of these recommendations," he continued, "control of inventory, close watch of business statistics and simplification have a direct bearing on the elimination of that largest of all contributing factors to industrial waste, the boom and the slump. The slump following the boom is the most disastrous catastrophe that can befall industry. It has been repeatedly affirmed that in the elimination of this variable condition, this rise and fall of prosperity, is to be found the greatest relief from industrial waste."

In closing his talk Mr. Wetherill emphasized the need for industrial cooperation similar to that now being employed by the division of simplified practice in reducing waste in American manufacturing methods. The seeming paradox of high wages and continually reduced prices of commodities, he said, has been brought about only by this sort of cooperation and the constant introduction of new methods and ideas which have made for the elimination of waste in every department of industry from the original procuring of raw materials to distribution to the ultimate consumer.

## Honor Roll in Waste Elimination

In a paper entitled "The Roll of Honor in Waste Elimination," E. E. Hunt, also of the Department of Commerce, attempted to rate the great industries of the country according to the part they have played in the elimination of waste, which, as he brought out, is considered by Europeans to be largely responsible for our prosperity.

First place on this roll he gave to the engineering profession. Tracing the historical background of engineering, he explained that its earliest exponents had always been concerned with devices by which human effort might be saved, and that the growth of scientific knowledge in recent years made it almost impossible to dispute the preeminence of engineering enterprise in the field of waste elimination.

Following in consecutive order, according to Mr. Hunt, are the railroads, the electrical industries, together with the development of super-power systems, the automotive industries and the building trades. All of these interests, he explained, have been particularly active since the close of the War, and have impressed their importance upon the people.

## Economies Arising from Selection of Personnel

In discussing "Elimination of Waste in Selection of Personnel," Mrs. Frank B. Gilbreth, member of the Taylor Society and one of the three woman members of the A. S. M. E., emphasized the need for beginning early with the work of vocational guidance for children. She explained the importance of encouraging the properly qualified young men and women to present themselves for experience in the various lines of work for which they have an aptitude, and emphasized the importance of psychological tests in choosing workers.

Mrs. Gilbreth threw a new light on the problem of labor turnover by stating that instead of continually lamenting the high labor turnover some fields of industry might profit by more of it. She said that the

(Concluded on page 1317)



*Steam Drive of 36-In. Blooming Mill, Sept. 4, 1926*



*Steam Engine Entirely Removed, Sept. 6*



*Completing the Excavation for New Motor Drive, Sept. 7*

## Changes Drive

Inland Steel Co. Electrifies  
Time—Bar and  
Also

ON Sept. 5 the Inland Steel Co., Chicago, shut down its steam-driven 36-in. blooming mill at Indiana Harbor, Ind., and six days  $3\frac{1}{4}$  hr. later was again rolling steel, with a new motor drive. Simultaneously with this change, the steam engines on a 24-in. bar mill and a 24-in. billet and sheet bar mill were removed and motor drives were installed. A well arranged construction program and the use of quick-setting cement were important factors affecting the success of the undertaking.

The 36-in. blooming mill is a two-high reversing mill. It was previously driven by a twin simple engine with cylinders, 50 x 60 in. The motor now in use was built by the Westinghouse Electric & Mfg. Co. and is rated at 7000 hp. continuously, with a maximum torque of 2,000,000 ft. lb. The 24-in. bar mill is a two-high, four-stand, reversing mill, which was driven by a twin simple engine with 36 x 48-in. cylinders. The engine has been replaced by a General Electric Co. reversing motor rated at 3000 hp. continuously and having a maximum torque of 500,000 ft. lb. The 24-in. billet and sheet bar mill is a three-stand, three-high mill, which was driven by a 38 x 72 x 60-in. tandem compound engine. The engine has been replaced by a 3000-hp. induction motor, driving the mill through a reduction gear.

The mills were shut down at 8 a. m. on Sunday, Sept. 5. The time required for removing the blooming mill engine was 12 hr. No effort was made to save any part of the engine, and it was removed in as large pieces as the crane could handle. The maximum lift was the crankshaft, which weighed 65 tons. To provide foundations for the motor it was necessary to excavate 225 cu. yd. of concrete, and this work could not be undertaken before the engine was removed. The removal of the concrete and such other excavating as was necessary for the new foundations required 46 hr. So far as possible, concrete forms and templates for the foundation bolts were made up before work started. It was necessary to exercise care in setting the foundation bolts for the motor, as there were 32,  $3\frac{1}{2}$ -in. bolts, eight of which at the mill end extended through the bearing, pedestal and cap. It was necessary, therefore, that they be set accurately and kept plumb. The bolts through the bearing were set so that they extended approximately 8 ft. above the surface of the concrete, and they were held at the top by a second template accurately lined up with the main template supporting them. The time required to set the concrete forms and foundation bolts was 11 hr.

About 120 cu. yd. of concrete went into the motor foundation, and this was poured from a 1 cu. yd. car mixer in 4 hr. It was allowed to set 11 hr. before the assembly of the bed plate was begun. The motor



# in Six Days

## Blooming Mill in Record Sheet Bar Mills Motorized

bedplate was bolted together before being set on the foundation and was handled as one piece by the crane. The bedplate is approximately 20 ft. square and weighs 37 tons. It was successfully slipped over the foundation bolts, although the clearance between the bolts and the holes was only  $\frac{1}{8}$  in. It was completely lined up ready for grouting in 9 hr. The bedplate was grouted immediately after being lined up on the foundation, and the total time required for grouting and the setting of the grout was 9 hr.

The lower half of the motor field, the lower half of the brush rigging and the lower half of the end bell were then assembled on the bedplate, the time required being 4 hr. The armature, with shaft, presented some difficulty in handling, as it weighed between 85 and 90 tons and could not be lifted by one crane. A spreader bar was built so that two cranes could be used, but this reduced the available lift to such an extent as to make the handling of the armature awkward. It was necessary carefully to adjust the slings so that the shaft would be horizontal when lifted. Because of the time required for adjusting slings and handling, it took 6 hr. to move the armature from outside the building and set it in the bearings. One hour was required to erect the upper half of the frame. Thirty hours was needed to complete the assembly of the brush gear and motor connections, to fit in the brushes and to set the brushes on neutral.

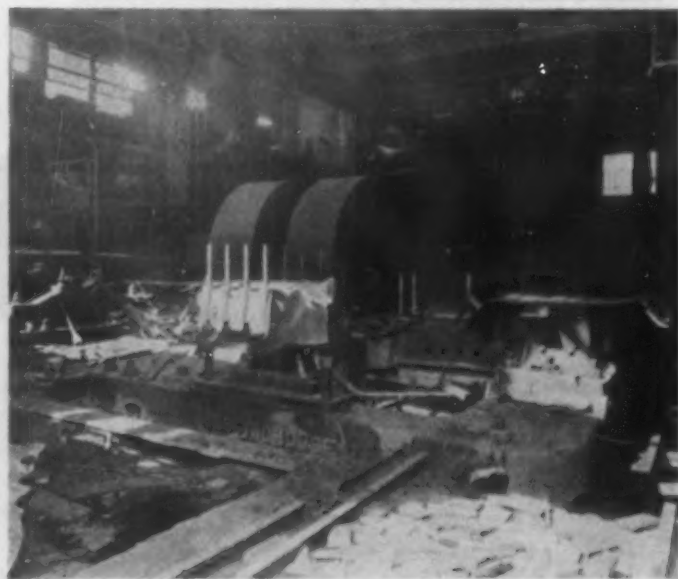
The motor was turned over at 7 a. m. on Saturday, Sept. 11, and it took  $4\frac{1}{4}$  hr. to test the control equipment, to make adjustments and to correct errors in connections. The first ingot entered the rolls at 11.15 a. m. on Sept. 11, and the mill then continued in regular operation. The total elapsed period from the time steel was rolled with the engine until it was rolled with the motor was six days  $3\frac{1}{4}$  hr.

The flywheel motor-generator set and control equipment had been erected previously, and the main armature and field connections had been run as far as possible before shutting down the engine. During the time the motor was being erected, large air ducts for ventilating the motor-generator set and the reversing motor were excavated and concreted and air fans were erected, so that when the reversing motor started, the fans for cooling were in operation.

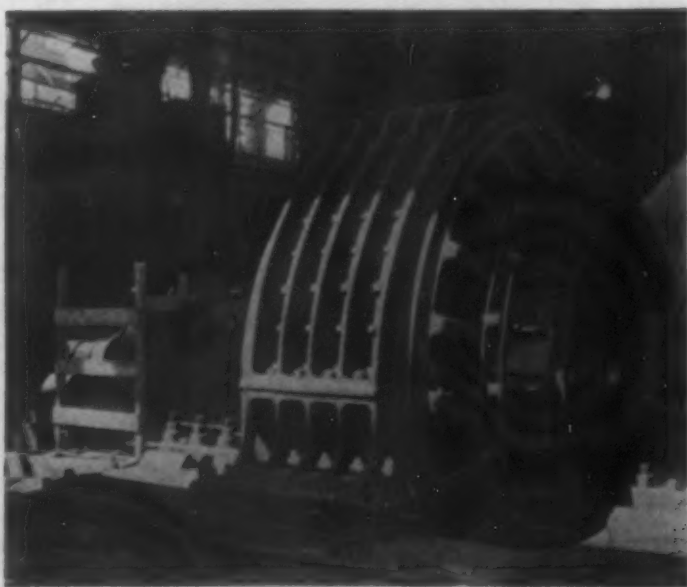
The 24-in. bar mill engine, which weighed approximately 200 tons, was removed in 8 hr. The old foundation, which had to be removed to make room for the motor foundation, was of brick in cement. One hundred and nine cubic yards of this foundation was removed in 23 hr. Concrete forms and foundation bolts were set in 5 hr., and 90 cu. yd. of new concrete was



*Setting Bolts Preparatory to Placing Concrete for the Motor, Sept. 8*



*The Motor Bedplate in Place, Sept. 9*



*The Blooming Mill Motor in Operation, Sept. 11*

*(Concluded on page 1317)*

### Plane-Like Hand Sander

The Porter-Cable Machine Co., Syracuse, N. Y., has brought out a hand belt surfacing machine, which it calls the "Take-About" Sander. It is planned to replace hand sanding or polishing on wood or metal, as a device for doing such work more quickly and leaving a better finish than when done by hand, and at a negligible operating cost. Because the use of a hand plane



*Portable Motor-Driven Sander for Sanding or Polishing of Wood or Metal. The weight is 12 lb.*

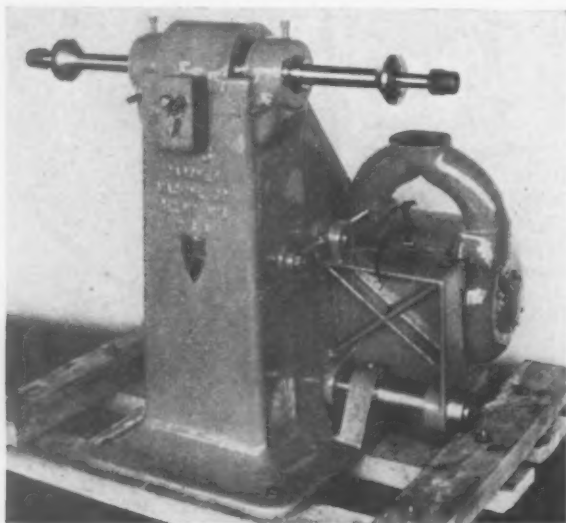
is natural and familiar to everyone, the machine has been designed for plane-like handling.

Concave or convex surfaces may be sanded, because the shape of the block over which the belt travels determines what form the belt shall take. For sanding interior curves of diameters larger than the diameter of the front pulley, which is  $2\frac{1}{4}$  in., the sander may be tilted or lifted into the proper position. For grinding and polishing large metal surfaces, which otherwise would have to be gone over by hand, this machine may be equipped with a flexible pad in place of the regular solid form block.

The frame of the machine with the exception of the motor cap is a one-piece aluminum casting and the motor cap and pulleys are also cast from that metal. The weight is 12 lb. In spite of the light weight, it is equipped with a  $\frac{1}{3}$  hp. universal motor.

### New Drive for Polishing Lathe

The chief distinctive feature of the polishing lathe here shown is the mounting of the motor on a hinged bracket at the rear of the base. The belt is inclosed with a heavy sheet metal guard and is made to run tight at all times, since motor adjustment is provided



*The Motor is Mounted on a Hinged Bracket at the Rear of the Base. This saves floor space and assures better belting conditions*

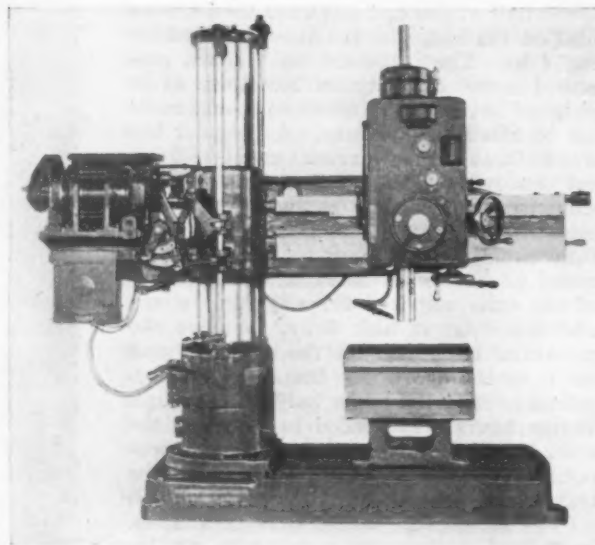
to take up all belt stretch. Thus the arrangement is emphasized as conserving floor space, insuring better belting conditions, and providing a compact, self-contained machine which may be installed in a factory at a point dictated by convenience. A push button control station is built into the base, and starter is mounted on a nearby wall.

The machine is built by the Gardner Machine Co., Beloit, Wis., and in general construction is identical to the standard Gardner No. 3 belt-driven polishing lathe.

### Four Thread Leads in New Heavy Duty Radial Drill

An unusual feature of the new 4-ft. heavy duty radial drill of the Morris Machine Tool Co., Cincinnati, is the feed unit, which is arranged for four thread leads: 8,  $11\frac{1}{2}$ , 14 and 18 threads per in. There are eight feeds ranging from 0.005 to 0.042 in. per revolution of spindle and the four thread leads.

The motor and a ball bearing speed box are mounted on the arm, an arrangement which minimizes the number of gears, shafts and bearings, results in a corresponding saving of power, and serves for balancing the arm. The arm raising and lowering unit is mounted on the back of the arm and is in operation only when the arm is being raised and lowered. Either



*The 4-ft. Morris Radial Drill Has Leads for 8,  $11\frac{1}{2}$ , 14 and 18 Threads per Inch*

a direct current variable-speed motor or a constant speed motor with a ball bearing speed box can be used.

One lever operates two clamp screws for clamping the head on the arm. The feed worm wheel dips in a trough of oil, and oil is distributed throughout the head from an oil reservoir at the top, which may be filled once daily through an oil cut.

The spindle, a hammered steel forging, runs in phosphor bronze bearings in the sleeve and is driven by two keyways. The sleeve is of steel fitted with bronze bearings, and the rack is cut directly in the steel sleeve. The helical spindle gears are made of a special alloy steel, heat treated and hardened and are of a small diameter in order to keep the peripheral speed down to a minimum. Back gears, back gear clutches, spindle gears and feed gears are of chrome nickel steel, heat treated and hardened.

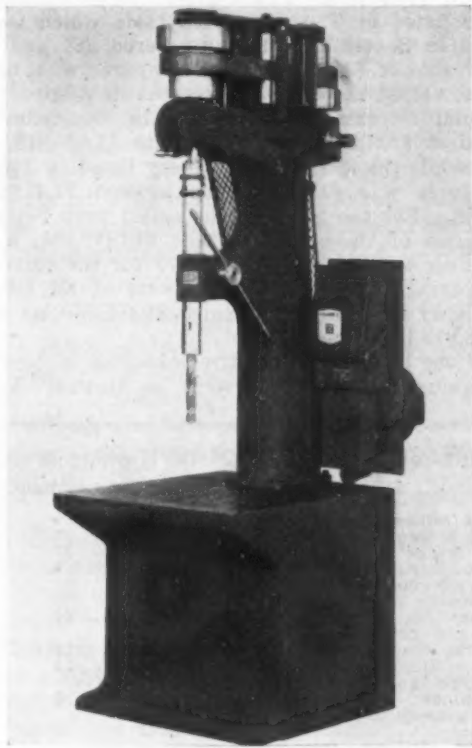
The tapping attachment, which runs in oil, and the back gear bracket form a unit which is mounted on the back of the head. Frictions in the tapping attachment are of the multiple disk type.

The Atlas Foundry Co., Marion, Ind., manufacturer of gray iron castings, has reopened its No. 2 foundry, following a shut-down for more than a year past. Plant No. 1, has been placed on a full day and night schedule. M. F. Gartland is president, and Frank Gartland, general manager.



### Makes Sensitive Drilling Machine for 1¼-In. in Cast Iron

The Footburt No. 3 sensitive drilling machine, built by the Foote-Burt Co., Cleveland, with a capacity of 1¼ in. in cast iron or ¾ in. in steel, is shown



*The Cabinet Base Permits of Bolting Two or More Machines Together, Forming a Gang Sensitive Drill With 15 In. Between Spindle Centers*

in the accompanying illustration. It is intended for production work. Due to the length of the spindle travel, it has been possible to eliminate spindle bracket with vertical adjustment and adjustable table. It is designed to be set up for one particular type of job, although it is possible to use various types of jigs on the box type table, so that the machine can be used for other jobs should it be found necessary.

The original distance from the spindle nose to the top of the table can be set to suit the requirements of the individual purchaser. By using a filler block under the upright, this distance can be increased if it should be desirable. The spindle is 1¾ in. in diameter at the driving end, is bored to receive a No. 3 Morse taper and two keyways are used for driving.

One of the features is the design of the cabinet base. This is arranged so that two or more machines can be bolted together, thereby forming a gang machine, with a distance of 15 in. between spindle centers. Thus after the first unit is purchased, additional units can be added as production increases, so that a number of units may be handled by one operator. This makes possible a great saving in floor space. The right hand end of the pulley shaft is arranged for coupling to the left hand end of the drive shaft of the next unit, so that a number of units, depending on the size of the cut, can be driven with one drive arrangement.

The machine may be equipped with automatic power feed, similar to other Footburt sensitive drilling machines. The illustration shows the machine arranged with motor drive. When belt driven, the tight and loose pulleys are mounted in the same place as the single pulley shown. Roller bearings are used throughout. The set of spiral gears and the bearings in the gear box run in a bath of oil. All other bearings are lubricated by the Alemite system.

Three speeds are provided, these speeds being changed by operating the handle located at the front of the machine, which shifts the belt to the various steps of the three-step cone pulley. Both vertical cone pulleys are solid, acting as flywheels, which aid, of course, in preventing the spindle from stalling when the drill breaks into the work.

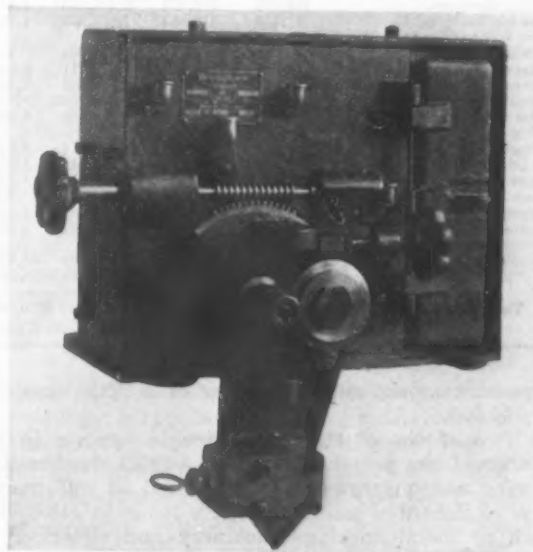
### Offers New Automatic Arc Welding Equipment

A device known as the Auto-Arc, for automatically feeding a continuous welding wire, used in metallic electrode welding, to the work, has been brought out by the Westinghouse Electric & Mfg. Co., East Pittsburgh. It is arranged to feed the welding wire at any speed up to 3 ft. per min., which is necessary to maintain a constant arc length and a constant arc voltage. This machine strikes the arc automatically and, if necessary, will exert a pull of approximately 200 lb. in order to prevent fusion of the electrode wire to the work.

The device is featured as relieving the operator of the labor of maintaining the arc and feeding the welding wire. It is stated also that, due to the electrical conditions of the arc remaining practically constant, it is possible to secure a better weld and to deposit metal faster than by hand welding. This equipment can be used to best advantage perhaps on work requiring the welding of long, continuous seams in production manufacturing operations, and also for some repair applications such as building up worn cross-heads and guides and valve guides for locomotives. It may be used also in building up worn flanges for yard locomotives and street railway car wheels.

The arc length maintained can be adjusted so that the arc can be maintained at an average value of from 15 to 20 volts, and will remain almost constant at any given voltage. The ¼-hp. feed motor and the electromagnets do not obtain power from the arc circuit, and are therefore selected large enough to feed any size wire up to ¾ in.

In addition to better fusion due to the use of a higher current, ease of operation and uniformity of deposit, reduction in costs due to the ability to use



*Welding Wire Is Fed Automatically to the Work at Any Speed Up to 3 Ft. Per Min.*

wire in continuous lengths and eliminating the necessity of straightening and cutting are advantages claimed. Other features of this equipment are dirt-proof housing and accessibility of parts.

Advertisements inviting bids on the first lot of 100 armored cabs for use on mail trucks in the campaign against mail bandits were issued Oct. 27 by Postmaster General New. The bids are returnable at 2 p. m., Nov. 10.

## EXPORTS OF MACHINERY GAIN

September Total Shows Increase of \$4,500,000  
Over August—Imports Also Larger

WASHINGTON, Nov. 1.—Exports of machinery in September totaled \$36,901,003, as against \$32,459,844 in August. For the nine months ended with September of the present year, the total value of exports was \$307,433,529, as compared with \$271,980,396 for the corresponding period of 1925. While machinery exports in September showed a gain of practically \$4,500,000 over August, for the nine months of the current year the increase was almost \$36,000,000 over the same period for last year. Compared with September, 1925, machinery exports in September of the

of industrial machinery totaled \$134,559,544, compared with \$126,355,355 in the corresponding period of 1925. Exports of all power-driven machinery in September, 1926, were valued at \$1,145,406, while for the nine months the total was \$10,769,569. The value of exports of other metal-working machinery in September of the present year was \$439,626, and for the nine months, \$3,391,901. Power-driven metal-working machines listed in THE IRON AGE table which were exported in September, 1926, numbered 727 and had a total value of \$462,640. This compares with 643 machines, valued at \$545,874, exported in August.

Total imports of machinery in September were valued at \$2,088,430, compared with \$1,608,918 in August, while the total for machinery listed in THE IRON AGE table was \$1,432,378, as against \$1,453,909 in August. For the nine months ended with September, the value of these imports was \$13,572,065, a sharp gain over the figure of \$8,289,070 for the corresponding period of last year. Imports of all industrial machinery in September totaled \$1,405,950, as against \$1,608,918 in August.

Of the 12 steam locomotives exported in September, six, valued at \$108,044, went to Central America.

Machinery Exports from the United States  
(By Value)

	September, 1926	September, 1925	Per Septem- ber	Ended September, 1925
Locomotives.....	\$189,052	\$321,338	94.7	4,178,139
Other steam engines.....	144,880	285,164		1,712,337
Boilers.....	133,567	181,023	1	1,388,933
Accessories and Parts.....	247,107	194,367	1	1,516,130
Automobile Engines.....	872,297	1,402,323	10	12,976,141
Other Internal Combustion Engines.....	917,701	826,657	92	3,965,806
Accessories and Parts for.....	742,467	586,632	79	3,140,072
Electric Locomotives.....	447,943	56,783	123	361,828
Other Electric Machinery and Apparatus.....	686,543	633,439	108	5,121,030
Excavating Machinery.....	542,462	290,47	187	2,707,112
Concrete Mixers.....	46,847	50,4	93	578,949
Road Making Machinery.....	119,195	97,506	122	1,070,226
Elevators and Elevator Ma- chinery.....	530,862	165,278	318	1,654,651
Mining and Quarrying Ma- chinery.....	1,235,352	663,046	185	7,452,844
Oil Well Machinery.....	1,963,710	892,125	220	7,256,005
Pumps.....	573,242	662,306	86	5,842,026
Lathes.....	121,391	184,401	66	1,839,038
Boring and Drilling Machines.....	67,088	47,654	141	533,202
Planers, Shapers and Slotters.....	44,323	23,574	188	463,134
Bending and Power Presses.....	223,858	69,151	324	479,761
Gear Cutters.....	25,672	68,926	37	652,694
Milling Machines.....	54,373	107,630	50	1,255,209
Thread Cutting and Screw Machines.....	41,600	116,435	35	837,303
Forging Machines.....	57,011	3,717	153	192,099
Sharpening and Grinding Ma- chines.....	139,094	245,349	57	2,388,265
Other Metal Working Ma- chinery and Parts of.....	439,626	370,890	118	4,128,315
Textile Machinery.....	781,577	1,116,807	70	8,289,624
Sewing Machines.....	784,870	572,223	137	6,556,662
Shoe Machinery.....	91,375	111,651	82	1,065,988
Flour-Mill and Gristmill Ma- chinery.....	91,294	13,291	687	161,908
Sugar-mill Machinery.....	515,220	1,142,723	45	5,266,621
Paper and Pulp Mill Machinery.....	130,447	166,550	78	1,105,968
Sawmill Machinery.....	102,193	84,986	120	577,931
Other Woodworking Machinery.....	115,971	97,229	119	1,039,436
Refrigerating and Ice Making Machinery.....	424,548	178,276	238	1,654,295
Air Compressors.....	284,309	359,846	79	2,960,483
Typewriters.....	1,428,150	1,384,812	103	13,145,092
Power Laundry Machinery.....	101,861	62,400	163	801,986
Typesetting Machines.....	435,995	240,244	181	2,608,184
Printing Presses.....	569,105	373,482	152	3,573,790
Agricultural Machinery and Implements.....	8,338,082	5,800,532	144	60,531,337
All Other Machinery and Parts.....	12,097,774	9,657,136	125	80,022,822
Total.....	\$36,901,003	\$32,459,844	114	\$271,980,396

present year showed an increase of a little more than \$7,700,000.

Two of the outstanding gains in exports in September of the present year over August were made in mining and quarrying machinery and oil well machinery. Substantial gains also were made in other lines, such as metal-working machinery and electrical machinery. Exports of all items listed as industrial machinery in September were valued at \$16,270,297, as against \$14,167,257 in September of last year. For the nine months ended with September, 1926, exports

## Exports of Power-Driven Metal-Working Machinery

	September, 1926		August, 1926	
	No.	Value	No.	Value
Engine lathes.....	18	\$51,814	20	\$75,066
Turret lathes.....	9	24,739	23	5,352
Other lathes.....	48	44,838	37	36,423
Vertical boring mills.....	6	9,740	9	14,068
Thread-cutting and automatic screw ma- chines.....	53	41,609	66	48,927
Knee and column-type milling machines.....	17	28,883	12	25,310
Other milling machines.....	13	25,490	22	45,370
Disk-type gear-cutting machines.....	..	.....	6	13,109
Other gear-cutting ma- chines.....	40	25,672	12	42,227
Vertical drilling ma- chines.....	32	13,541	16	61,545
Radial drilling machines.....	6	12,750	3	8,282
Sensitive drilling ma- chines.....	43	2,277	80	1,254
Other drilling machines.....	128	28,780	91	25,210
Shapers and slotters.....	149	29,068	55	32,499
Planers.....	3	15,255	..	.....
External cylindrical machines.....	31	43,917	19	39,492
Internal grinding ma- chines.....	86	39,332	22	35,335
Metal-working tool- sharpening machines.....	45	24,935	150	36,405
Total.....	727	\$462,640	643	\$545,874

For the nine months, exports of steam locomotives numbered 231, of which only 19, valued at \$357,994, went to Central America. The largest exports of locomotives to any one country in the nine months were to Brazil, which took 53, with a value of \$1,339,115. No shipments of steam locomotives were made to Brazil in September of the present year.

Mexico led as a destination for American sewing machines in September and in the nine months ended with September. For the month, 4084 machines, valued at \$147,432, went to that country, while for the nine months the number was 35,308, with a value of \$1,217,623. The United Kingdom was the next largest buyer of American sewing machines, taking 1520, valued at \$82,599, in September, while for the nine months the number was 15,260, valued at \$840,191.

Exports of agricultural implements from the United States in September totaled \$8,338,082, and during the first nine months of 1926 amounted to \$72,513,099. This is only \$400,000 less than the exports during the entire calendar year 1919, which was the third highest yearly total on record, and exceeds the annual ship-

Schedule of the next installments of the *Business Analysis and Forecast*, by Dr. Lewis H. Haney, Director New York University Bureau of Business Research, follows: Nov. 11—Activity in Steel Consuming Industries; Nov. 18th—Position of Iron and Steel Producers; Nov. 25—General Business Outlook.



# In This Issue

*The greatest source of industrial waste is the business boom with its inevitable follower, the slump.—Close watch of business statistics, control of inventory, and budgeting of sales, production, and finances are the principal factors in eliminating wasteful fluctuations in business, says Department of Commerce executive.—Page 1283.*

*If you polish stainless iron, it withstands corrosion longer.—Unpolished, heat-treated sheets show the poorest results in salt spray test. Unpolished specimens, before heat-treating, stand up rather well, but corrosion resistance is greatly improved by polishing.—Page 1267.*

*Disarrangement of manufacturing schedules caused by sandwiching orders for special work in with production of standard products is overcome by chain manufacturer.—Finds that it pays to handle "specials" in a department entirely divorced. Such department has its own equipment, inspection force, and management.—Page 1270.*

*America shipped more iron and steel abroad in September and bought less.—Exports were 6 per cent above August, while imports declined 7 per cent.—Page 1323.*

*Unfair competition of "sweatshop" labor is warred against by League of Nations Labor Bureau.—Geneva organization is working to improve labor conditions in Asiatic countries, where labor is oftentimes so poorly paid as to preclude Western competition.—Page 1276.*

*"Economically unsound," says steel fabricators' association head regarding steel mill competition.—Declares that "mill domination is responsible for the shrinkage of fabricated structural steel from the market within the past two years."—Page 1280.*

*Stainless iron sheets very high in tensile strength.—Much stronger than mild steel sheets, metallurgist finds. Heat-treatment will increase strength to about 185,000 lb. per sq. in., though elongation is considerably reduced.—Page 1267.*

*Declares steel construction has many advantages over reinforced concrete.—Uses less space; always gives warning of impending failure; can be changed and repaired more easily, says professor of civil engineering.—Page 1282.*

*Ford uses coke oven gas in cutting torches for scrapping ships.—Though cutting speed is higher with acetylene, the coke oven gas is found to be cheaper in this case.—Page 1272.*

*The pros and cons of welding steel structures.—Stresses would have to be calculated with great accuracy, but welding would simplify design. Instead of employing one large weld where a heavy load is to be carried, design should permit of a number of small welds. Working specifications needed to remove possibility of failure of welds due to the "human element."—Page 1326.*

*Iron and steel mills will be affected by increase in wages of non-union coal miners.—Higher costs will be imposed on producers operating non-union mines. Merchant pig iron producers having contracts for Connellsville coke will have to pay about 75c. per ton more.—Page 1292.*

*Stainless iron sheets can be easily welded.—No flux is necessary. In oxy-acetylene welding the best results are obtained by using stainless iron as a filler. A V-notch joint overcomes cracking due to expansion.—Page 1266.*

*Declares riveting is more dependable than welding.—"Because of the human factor in welding, no weld is better than the welder," says A. F. Jensen. Rivet holes aline and determine the squareness of the structure, irrespective of the erectors.—Page 1327.*

*Labor turnover cut in half by Bethlehem Steel.—From 135 per cent in 1923 to 67 per cent in 1925. Fluctuation in employment has also been sharply reduced. In 1925 the high and low points were barely 10 per cent from the average for the year.—Page 1276.*

*New coke plant saves power house space by using turbo-blowers.—Everett, Mass., plant has two 5000 hp. blowers, having a combined weight of approximately 50 tons, about one-tenth the weight of the old type reciprocating engines, one of which would require the entire floor area of the power house.—Page 1278.*

*Pig iron output gained in October.—Estimated daily production was 106,891 tons, 2¼ per cent above September. Number of furnaces in blast Oct. 31 was 218, a gain of 2 over Sept. 30.—Page 1297.*

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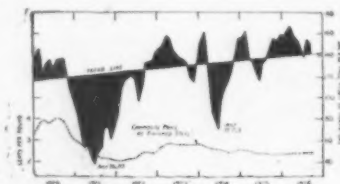
## Steel Needs Call for 79 Per Cent Operation

AT the beginning of this decade we needed 116,000 tons of steel ingots per working day. This is shown on the chart published once a month in connection with the production figures for steel, (reproduced here in postage stamp size). From this it may be deduced that our per capita consumption was then around 780 lb. per annum. In the few years intervening, demands have increased until the needs for each person per year now average 870 lb.

Meanwhile in the past 12 months we have been making steel at a per capita rate of 930 lb. However, all the excess, shown in black areas above the inclined trend

line of theoretical needs, is not actually equal to the deficiencies, shown in black underneath the line—at least for the period since the marked slump of 1921. And for proof, production records show that in the four full years since 1921 we made 159,000,000 tons of steel ingots, while the consumption called for 164,000,000 tons.

On the face of these figures there appears to be little reason for a sustained or sharp recession. Incidentally a consumption of 870 lb. per person per year corresponds at present to a 79 per cent scale of operations, on the basis of a 56,000,000 ton capacity.



For News Summary See Reverse Side



ments during all other years with the exception of 1920 and 1925. Slightly more than one-third of the shipments during the nine-month period consisted of wheel tractors, of which 43,861, valued at \$24,493,953, were exported. This was an increase of \$4,000,000 over the shipments during the same period of 1925. The second largest item among exports in this period was harvesters and binders, which numbered 43,825, valued at \$7,644,762. Exports of harvesters and binders showed an increase of \$2,500,000, as compared with the same period of 1925. The third largest item was threshers, which totaled 5218, valued at \$4,813,729, and the fourth and fifth largest items were parts of tractors and plows, each of which exceeded \$4,000,000 in value exported. Exports of threshers and parts of tractors increased by approximately \$1,500,000 each over the same period of 1925, while exports of plows decreased by about \$800,000. There were substantial increases in the exports of all other items, with the exception of harrows, cultivators, planters, mowers, hayrakes and tedders, windmills, and hay binders.

The steady and large export movement of American typewriters was continued in September. The United Kingdom led as a destination both for Sep-

Imports of Machinery into the United States

	(By Value)		Nine Months Ended September	
	September		September	
	1926	1925	1926	1925
Metal-working machine tools and parts .....	\$35,043	\$16,499	\$331,842	\$283,016
Agricultural machinery and implements .....	233,029	288,886	4,082,358	2,533,299
Electrical machinery and apparatus .....	53,766	94,675	652,391	636,299
Other power generating machinery .....	482	322	5,576	7,577
Other machinery .....	883,184	441,905	6,889,983	3,467,118
Vehicles, except agricultural .....	226,874	122,367	1,609,915	1,361,761
Total .....	\$1,432,378	\$964,654	\$13,572,065	\$8,289,070

tember and the nine months ended with September. For the single month, the number going to the United Kingdom was 3777, with a value of \$202,103, while for the nine months the number was 40,150, with a value of \$2,189,215. France ranked second. During the month shipments to France included 2276 typewriters, with a value of \$127,486, while for the nine months 28,507 typewriters, valued at \$1,496,525, went to France.

Immigration in August

Aliens admitted to the United States in August, according to the Bureau of Immigration, totaled 49,753 of which 29,286 were immigrants. Alien departures included 7376 emigrants and 15,410 non-emigrants, making a total of 22,786. The net increase in the United States alien population, therefore, was 26,967 for the month. Canada, with 7640 in August, led in the number of immigrant aliens sent to the United States and was followed by Mexico with 5935. From overseas, Germany contributed the largest number, 3843 immigrants coming from that country. The Irish Free State sent 2319; Italy, 2139; Great Britain and Northern Ireland, 1750; and the Scandinavian countries, 1592. During the month only 1612 immigrants came from the countries of Eastern Europe. Of the immigrants in August, 138 were classed as iron and steel workers, 50 as metal workers, and 162 as machinists.

To Dispose of Cleveland Steel Co. Mill

The Cleveland Steel Co., Cleveland, has placed its steel mill in the hands of D. C. Oviatt & Co., Cleveland, for disposal. The equipment consists of rolling mill, Mesta mill type engine, air compressors, heavy gate shears, bending rolls and machine shop equipment.

MECHANICAL ENGINEERS

Will Discuss Materials Handling and Machine Shop Practice at December Meeting

Machine shop practice, materials handling and management will again come in for special attention at the annual meeting of the American Society of Mechanical Engineers to be held at the Engineering Societies Building, New York, Dec. 6 to 9 inclusive. Among the features of the meeting also will be the Robert Henry Thurston lecture, scheduled for the late afternoon of Tuesday, Dec. 7, and to be given by Dr. Cecil Howard Lander, director fuel research, Department of Scientific and Industrial Research, London, England, discussing the latest discoveries in chemistry of coal. The Henry Robinson Towne lecture, speaker not yet announced, will be held late in the afternoon of Dec. 9. As usual the papers and subjects are so numerous that simultaneous sessions will be held on the different days, and on Wednesday evening, Dec. 8, will occur the annual dinner.

Among the papers scheduled are the following:

A Research in the Elements of Metal Cutting, Orlan W. Boston, professor of shop practice, University of Michigan, Ann Arbor, Mich.

Work-Hardening Properties of Metals, Edward G. Herbert.

Rough Turning with Particular Reference to the Steel Cut, H. J. French and T. G. Digges, Bureau of Standards, Washington.

Theory of Milling Cutters, N. W. Sawin.

Chromium Plating, William Blum.

Industry's Annual Tax for Materials Handling and Suggestions for Its Elimination, H. V. Coes, general manager Belden Mfg. Co., Chicago.

Industrial Applications of Conveyor Systems, C. A. Burton.

Lubrication of Steel Mill Machinery, C. H. Bromley, S. F. Bowser & Co., Fort Wayne, Ind.

Low-Temperature Carbonization of Coal, A. C. Fieldner.

The Distillation of Coal, W. H. Blauvelt, consulting engineer, 120 Broadway, New York.

Relations of Stokers to Boilers, W. A. Shoudy, consulting engineer, 50 Church St., New York.

May Hold International Engineering Congress in Japan

An international engineering conference is likely to be held in Japan in the fall of 1929. The department of commerce and industry of Japan has become interested, and the support and indorsement of the government of Japan has already been obtained. This information was received in New York, Oct. 16, by Dr. M. Kamo, president of the Society of Mechanical Engineers, of Japan, who was given a luncheon at the Engineers' Club in New York, Oct. 20, by representatives of five national engineering societies of the United States.

Fewer Accidents According to American Engineering Council

A reduction in the number of accidents per worker in manufacturing plants throughout the country was shown by Lawrence W. Wallace, executive secretary of the American Engineering Council, Washington, at the first meeting of the sixteenth annual National Safety Council, Oct. 25, in Detroit, in his report which covered information from 14,289 plants with 2,250,000 employees in ten of the major industries, including iron and steel, steam railroad, mining, machine building, metal working, building construction and electric utilities.

The American worker is turning out more goods at a smaller accident cost, Mr. Wallace declared. The report also disclosed that "indirect losses accompanying an accident are more pronounced than has been assumed."

## Increasing Coal Output a Stabilizing Factor

A combination of circumstances early in October has caused in many sections a marked stiffness in prices, according to the National Association of Purchasing Agents. Conditions at Southern tidewater shipping ports are without precedent. At this writing there are a score or more of boats awaiting coal cargoes for export. The heavy demand has drawn large quantities of cars to the seaboard with a resultant transportation shortage in several sections. There have also been greatly increased shipments made to the Lakes district, where stocks are unusually high. Some industries habitually stock up at this time of the year and are in the market. Bituminous coal production is steadily increasing, however, and if the output is maintained throughout the fall, will serve to stabilize the factor of supply and demand.

A total of 39,244,000 tons was consumed by industries in September, a gain of 2,000,000 tons over the preceding month. The association's coal survey indicates a slight tonnage increase of stocks on hand. As of Oct. 1, the total was 43,156,000 tons. A 33-day supply in stocks on hand was the average in all industries.

Bituminous coal output continues to increase, and September showed a total of 48,976,000 tons. Anthracite took a turn for the better and totaled 8,448,000 tons. The production of by-product coke during September fell off slightly to 3,641,000 tons. This amount constituted the output of 75 active plants. The output of beehive coke took a sharp upturn, showing a gain of 74.2 per cent over the preceding month, with a September total of 1,310,000 tons. The total coke production amounted to 4,951,000 tons, which required a consumption of 7,298,000 tons of coal.

Comparative Estimates of Production, Consumption and Stocks of Coal  
(In Net Tons)

	Production	Industrial Consumption	On Hand In Industries
May .....	47,113,000	36,813,000	38,876,000
June .....	50,417,000	35,541,000	33,918,000
July .....	51,901,000	36,514,000	36,998,000
August .....	54,577,000	37,152,000	38,641,000
September .....	57,424,000	39,244,000*	40,682,000
October 1.....	.....	.....	43,156,000

\*Subject to revision.

Coal Stocks of Industries Classified

	Days' Supply
Steel plants .....	21
Electric utilities and coal gas plants....	49
By-product coke plants.....	30
Railroads .....	31
Other industries .....	30

## New York Metallurgists in Joint Meeting Hear German Scientists

The local members of the New York chapters of the American Society for Steel Treating, the American Institute of Mining and Metallurgical Engineers and the American Institute of Metals held a joint meeting Wednesday evening, Oct. 27, at the Engineering Societies Building, 29 West Thirty-ninth Street, New York, preceded by a dinner at the Harvard Club. This meeting took the place of the regular monthly of the New York chapter of the steel treaters. The address of the evening was given by Dr. William M. Guertler, one of Germany's foremost metallurgists and director of the Berlin Metal Institute. Doctor Guertler was the E. D. Campbell memorial lecturer for 1926 at the annual convention of the American Society for Steel Treating in Chicago the week of Sept. 20.

At the meeting last week the lecturer took as his subject "On the Corrosion Resistance of Metals." A brief abstract of his remarks follows: All metals are crystallized and a metallic crystal resists a chemical reagent if the bonds of the atoms in the space lattice are stronger than the affinity to the reagent. Foreign atoms in the metallic crystal (solid solution) do not lower the stability as long as they are surrounded and protected by the atoms of the parent metal. On

physico-chemical grounds, solid solutions must be somewhat more noble than would be computed from the rule of mixtures. Heterogeneous alloys are only as noble as the least noble constituent and even less so in the presence of moisture. Pure iron has little resistance to many of the common chemical reagents, and to moist air. Its heterogeneous alloys are less resistant, although iron is capable of forming solid solutions with many elements, some of which are remarkably resistant to chemical attack. Chromium gives the greatest protection even though it, itself, is less noble than iron, and nickel, which is more noble. The protection afforded by chromium can be produced only by secondary effects. By numerous tests with combined chemical and mechanical attack, it is possible to determine the extent to which the observed resistance is due to automatic formation of a protective coating.

## Non-Union Coal Mines Raise Wages—Will Affect Iron and Steel Plants

PITTSBURGH, Nov. 1.—Events have moved rapidly in connection with coal mining wage scales since a week ago. Effective Oct. 27, the Pittsburgh Coal Co., which shut down all of its union mines two years ago on the premise that it could not operate them profitably on the Jacksonville wage scale and since a year ago last August has been operating some of them on the November, 1917, scale, which is approximately one-third under the Jacksonville scale, advanced its rates by approximately 55 per cent, going 5 per cent beyond the Jacksonville scale. With union mines rapidly going into operation on account of the high prices of coal, such action was necessary to retain the men it had, and the same reason has held good in the case of other companies operating on the November, 1917, scale of wages. The entire district, including northern West Virginia, is now back at least to the Jacksonville scale, and seemingly this is to be the condition at least through the winter. The reasons for these changes are to be found in the unusually heavy export demand for coal, but there are the additional factors of a heavy stocking movement by industrial consumers, who figured on an early termination of the British strike and an ample supply of coal for all requirements, and the usual seasonal expansion in domestic fuel requirements.

Foreign advices suggest that the British strike will end shortly, but here the opinion is commonly held that even if it does, the effect upon the situation will be psychological rather than actual and that there will continue to be an export demand of more than ordinary volume for some time, or until British production is restored to pre-strike proportions. Such a development, however, will take out of the situation much of its feverishness and curtail the speculative tendencies which have become so pronounced that, besides setting up embargoes against Atlantic ports, the railroads now have announced unwillingness to take shipments over the scales that are not consigned. In a market like the present one, it is a decided advantage to have loaded cars ready for consignment to the destination offering the highest price. The action of the railroads also has been necessary to prevent car shortages, because there is no more prolific waste of rolling stock than in loaded cars along sidings waiting for the middlemen to find a market for the coal.

As bearing on the iron and steel situation, the change in wage scales imposes higher costs on the steel makers who own coal mines and have been operating them on the non-union rate of pay. This does not include the Steel Corporation mines, which, though partly union and partly non-union, all pay wage rates established in August, 1923, which are the same as those called for in the Jacksonville agreement. The Jones & Laughlin Steel Corporation also has operated its mines on the union basis, as has the Inland Steel Co., which has coal properties in this district. Merchant pig iron producers are affected by the change, because those that have contracts for Connellsville furnace coke are forced by a clause in the contracts to assume the extra expense involved in the advance. This means about 75c. per ton.



# German Steel Bounty Case Waits

Commission's Report, Still Unpublished, Appears to Conclude That Rebates Are Not Paid—Treasury Department May Yet Invoke the Anti-Dumping Act

WASHINGTON, Nov. 2.—With the German-American Mixed Commission holding in its report that no bounties are paid in Germany on exports of pig iron or rolled steel products exported direct, American steel manufacturers who have protested to the Treasury Department against imports of steel from Germany are now relying for relief upon application of the anti-dumping act. The Customs Division of the Treasury Department for some time has had under way a broad investigation concerning reported dumping of iron and steel products from European countries. This applies especially to Germany, whose shipments to the United States during the past three months have shown a rapid rise and have represented the chief source of importation of both pig iron and steel. Despite the commission report, however, the Treasury Department has made it clear that it alone is to pass finally upon the case.

## State Department Makes the Issue Diplomatic

The full report of the commission has not been made public and apparently it is not proposed to give out the text. The so-called summary of the report carried no information other than that already published, and is understood to have been toned down to a brief generalization upon the insistence of the State Department. The Treasury Department, which gave out the summary, together with a preliminary statement of its own, indirectly rebuked the commission for arriving at conclusions when, as the Treasury Department stated, the function of the commission was solely to develop facts. The investigation appears to have been conducted largely through the State Department and the German Foreign Office, despite the fact that the Treasury Department had one of its own men on the commission. He was Charles L. Currill, customs attache in London. The other American representative was William Coffin, American consul-general at Berlin. He represented the State Department. The German members were Herr Hemmon of the German Foreign Office and Herr Vögt of the Ministry of Commerce.

The view is taken in some quarters that the American State Department evidently considered the question as not so much an economic issue as a diplomatic matter and proceeded almost to the point of unreason in its excess of caution lest anything be done that might irritate the German Government.

## Treasury May Apply Anti-Dumping Act

The Treasury Department in its statement pointed out that neither the conclusion as to no bounties being paid nor any other statement should be construed as the decision or expression of the Treasury Department on the question whether a bounty within the meaning of section 303 of the Tariff Act of 1922 is bestowed on finished wares manufactured from German rolling mill products. The Treasury press notice adds:

"As soon as the Treasury Department has had an opportunity to analyze the report of the commission and reach a conclusion in the matter its decision will be published for the information of all concerned."

This statement makes it clear that the Treasury Department has not closed the case and that its conclusions may be entirely different from those of the commission. The Treasury may consider that, even though the suspended countervailing duties should be entirely abrogated, action might be necessary through the anti-dumping act. This act itself is entirely separate from

the Fordney-McCumber Tariff law, and its provisions are more severe than the countervailing penalties. In this connection, however, there has been considerable speculation as to whether or not the recently organized cartel of European steel manufacturers actually has brought about higher steel prices and therefore reduced, if not entirely eliminated dumping.

## Text of the Official Summary

"No bounty is paid in Germany on exports of pig iron," says the summary of the report. "Rolling mill products, when exported direct, also receive no bounties. With regard to the exports of finished wares manufactured from rolling mill products, these fall into two classifications:

"1. Large orders for export are placed direct with steel producers, by the consumers at world market prices, as agreed upon between the plants and not higher than the prices fixed by the export committee representing the producers and consumers of iron under the agreement between the Raw Steel Syndicate of Düsseldorf and the Association of Iron Consuming Industries within the Association of Industries of the German Reich in Charlottenburg.

"2. The second case concerns smaller contracts or purchases from dealers' stocks. These are purchased at domestic prices and when afterwards manufactured and exported, are entitled to a rebate amounting to the difference between the domestic price and the world market price."

Continuing, the summary says: "The above mentioned agreement between the German steel producers and consumers provides in the second case for a control by a system of certificates whereby the certificate showing the actual amount of material exported may be given in part payment to the German steel works for new purchases of a similar amount of material. This transaction, according to the commission's report, appears to be a bonus, but when analyzed it amounts to a price concession made by the steel producing to the steel consuming industry on material which has been turned into finished wares and exported.

"The report of the commission presents a thorough survey of the situation. There are attached to the report the statements of the experts and practical examples of the operation of the agreement taken from books of manufacturers. The investigations were conducted in a spirit of mutual understanding, and the chairmanship was held alternately by German and American delegates to the commission."

## The Commission's "Conclusion"

In giving out this summary the Treasury pointedly said that the commission was a fact finding body "and did not undertake to deal with the interpretation of the laws of the United States of America or the application of the German-American commercial treaty. The report restricts itself to facts and leaves it to the Governments to draw their conclusions. The report of the commission is based upon the testimony of experts of the iron working and iron producing industries as well as an examination of the records of several of the organizations in question."

Although the Treasury statement says the report is restricted to facts and leaves it to the two governments to draw their conclusions, the summary indicates that the commission actually reached the conclusion that no bounties are paid but that rebates are paid on remanufactures when exported under certain conditions. It is this which apparently aroused the resentment of the Treasury Department.

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## Steel from the Product of the Kiln

THAT the world's largest producer of steel is erecting a plant at Lorain, Ohio, for the making of iron by a process which eliminates the blast furnace is a development of first-class importance. The problem of producing iron and steel direct from the ore has had a peculiar lure for metallurgists all over the world. In fact, the direct process in its simpler forms has been in use for centuries, and one iron and steel handbook lists no less than 67 modifications, most of them bearing the names of individuals, each of whom believed he had given the world something that might fairly be called revolutionary. But none of these inventions has opened the way to the large-scale production of iron and steel in economic competition with the product of the indirect method which utilizes the blast furnace for the making of pig iron preparatory to the refining operations of the steel plant.

In the past few years the great advance made in the design and construction of the rotary kiln and in the production and application of powdered fuel has given a new impetus to the effort for the low temperature reduction of iron ore, and this is the route followed in the development of the Hornsey process that is to be used at Lorain. Some of the difficulties which have defeated metallurgists in the past appear to have been overcome and in a quite simple manner. Chilling of the glowing sponge iron under proper conditions, preventing that reoxidation of the metal which has been the *bête noire* heretofore, is reported to be a feature.

The results of operations on a commercial scale are awaited with great interest, especially in view of the claims of large economies in fuel, wages and power bills and of a high degree of excellence in the product as prepared for charging into the open-hearth or electric furnace, as well as in the steel produced therefrom. This last result is particularly noteworthy since it is linked up with the claim that the process avoids certain liabilities of the blast furnace—carbon in excess, sulphur and combined nitrogen. In view of the vast amount of work put in recent years on the preparation of

iron ores for the blast furnace, notably in the agglomeration of fines, another feature is of special interest, namely, that fines are precisely the charge which low temperature reduction demands.

## Cross Currents in Steel Demand

WHEN this year's steel business is summed up it will be found that while the shipments in general have increased between 5 and 10 per cent over those of last year, some lines have had large increases and others have had decreases. The divergences will probably be particularly marked.

The oil and gas fields have taken an altogether unusually large tonnage of tubular goods. The pipe mills, with quite an increase in capacity over that of two years ago, have had a remarkably full run in their lap weld departments, and a new record will undoubtedly be made, by a large margin, in the production of oil country tubular goods. As to this line furnishing a cross current, it did so last year, when the production of welded oil country tubular goods was only 1,018,302 gross tons, against 1,358,889 gross tons in 1923, whereas the production of steel in general was slightly greater in 1925. The production statistics do not tell the whole story, for seamless tubing is being used in rapidly increasing proportions in well work, and seamless oil country goods are not reported separately.

The swings in consumption of plates for oil storage tanks are particularly wide. Bookings of oil storage tanks in the first nine months of respective years have been as follows, in net tons:

1923	264,563
1924	75,945
1925	64,259
1926	112,176

On the other hand, consumption of steel in building freight cars has decreased materially from last year to this year, although there is little doubt that there has been a substantial increase in the consumption of steel in repairing cars. Here is a cross current within a specific line. Partly for reasons of accounting policy, and partly because substantially all cars now in service are of large



capacity, the railroads are doing much more car repair work than formerly.

The above considerations suggest to the steel trade a closer and closer study of the distribution of steel into its various channels of consumption, to the end that manufacturing facilities may be in keeping with the demand and that salesmanship may be directed along correct lines.

### Metallurgy—A War Industry?

WILLIAM MARTIN, a prominent Swiss publicist, has written on the significance of the formation of the European steel cartel. In this article, which was published prominently by one of our newspaper syndicates, the author makes much of the moral reconciliation now being effected between the once warring nations of Europe, and says the latest cartel is noteworthy because "Metallurgy is essentially a war industry."

We wish to repudiate this last idea most emphatically. It is true that the soldier shoots metal bullets from steel gun barrels, but that does not make the steel industry "essentially a war industry" any more than the fact that soldiers eat food and wear wool makes the agricultural and textile industries "war industries." None of these three great undertakings, alike responsible for the present well being and comfort of civilized man, was conceived or nurtured with the idea that it would be of most value to fighting men.

Of course, in time of national emergency, when every nerve is strained to win a great war, a large percentage of metal, food and woolens goes to the army and navy. But for that matter as large a percentage of the manhood of that nation is then engaged in making war. Once peace is declared, the metal industries find themselves as quickly as do the returning soldiers, and it is safe to say that if every mechanic making war materials were thrown out of employment today, it would not make the slightest ripple on our economic equilibrium. Even those plants which were built during the war especially for war time purposes have been converted into other uses, and are just as busy making such implements of peace as washing machines, farm tractors and power plant machinery. One has only to think of the heat treater's art to appreciate how completely this lore (once the sole possession of the armor maker) has been absorbed by builders of machines of all sorts, of all sorts except for the making of war.

In the literary mind perhaps too much weight is given to the archaeologists' dictum that the bronze age superseded the stone age because the man equipped with bronze spearheads was an easy victor over his opponent. Similarly came the "iron age." The inference is that the only uses for metals for countless ages was for war-making purposes. As a matter of fact, it is far more likely that old swords and armor are preserved because they were used so little, while the knives and pots and cutting tools made in much greater quantity even then wore out from constant service. Be that as it may, museums show a rich variety of ancient articles made of metal undoubtedly used for domestic, agricultural or commercial purposes, dating back as far as the spearheads and shields (which, doubtless,

were used for hunting game far oftener than for hunting enemies).

Even in its infancy, there is consequently much reason to doubt that metallurgy was essentially a war industry. In historic times the proverbial saying about beating swords into plowshares indicates the transitory interest of the smiths in making war equipment. In its modern development how can one say that an industry is "essentially a war industry" which produces the steel plates for great bridges and steamships, trackage for the railroads, engines for automobiles, copper for the telephone, lead type for the printer, iron for the harvester, aluminum for the airship, pipe for the public services?

### The Declines in Cotton and Silver

THERE have been lately two major declines in important commodities, which are bound to have large economic consequences. They will undoubtedly elicit many speeches in the forthcoming session of Congress, wherein perfectly explainable economic events will be viewed as crimes against the people. Both cotton and silver have their sentimental aspects, even more than wheat and corn. Cotton has dropped almost steadily in price from its zenith at 36 cents a pound in December, 1923. In a little over a year it has fallen from 24 cents to about 12½ cents, half of this decline occurring in the last six weeks.

The reason is simple. There have been unusually large crops in two successive years, the result of over-planting, whereby supply has become in excess of demand at the former level of price, with the economic consequence that the surplus can be absorbed only at a reduced price.

This is a perfectly natural happening, for which producers rightfully can blame nobody but themselves. The plans for helping these misguided producers that are now being formulated by the Government and by bankers will not save the situation, for the mere taking of a certain quantity of cotton from the market and warehousing it will not be a panacea. The most that it can do is to avert some distressed selling, of course at the cost of carrying charges.

Cotton at a very low price is a calamity for the Southern producer, and will cripple his buying power and may embarrass him in meeting obligations for purchases previously made on the instalment plan. On the other hand cheap cotton will be to the advantage of consumers elsewhere.

Silver has been the alleged victim of "crimes" ever since the demonetization in the seventies. No group of people has been more vociferous than the silver producers of our West. Many other persons have considered that in some way the treatment of silver as a commodity was an offense against them, and politicians, including Bryan, acquired prestige and profit by their cajolery of that sentiment. In point of fact the bulk of the silver is produced by the big mining and metallurgical companies that have their headquarters in the shadow of Wall Street.

For some years back the price of silver appeared to be stabilized at around 65 to 70 cents per ounce. Recently it has fallen to the neighborhood of 50 cents from which level no early

recovery appears likely. This is in effect an economic decline that involves readjustments.

As to the causes for it there is no mystery. The Indian Government has been advised by a commission to go upon a gold basis and to liquidate its immense hoard of silver, and these recommendations probably will be followed. The liquidation undoubtedly will be done very slowly and no great disturbance from it is to be feared. But what is of immediate and powerful bearing is that India ceases to be a buyer of silver. Consequently the world's annual supply of about 240,000,000 ounces is deprived of a 40,000,000-ounce demand. There can be adjustment to the new conditions only by curtailment of supply, and reduced price is the only thing that will do that.

Inasmuch as a very large proportion of the supply is derived as a by-product from the treatment of lead, copper, and zinc ores by big producers there is unlikely to be much curtailment of production by them. The effect upon them will be to reduce their profits. The curtailment of production must come from the smaller producers, whose profits may be contracted to below the marginal point, and from silver producers pure and simple.

But while the declines in cotton and silver are fully understandable, it is impossible to shut our eyes to the fact that they are not mere ephemeral occurrences, and that such serious depreciations in two important commodities are sure to have disagreeable consequences that will be felt by many persons, directly and indirectly.

### New Burden for Railroads

AMERICAN railroads have so far improved their trackage and rolling stock (particularly in the use of more powerful locomotives) that they have been able to increase the length of freight

trains to an average of 46.3 cars, according to the Interstate Commerce Commission. In 1913 the average train was 31 cars. By 1924 it was 41.7 cars, last year 43.8 cars and now there is a further gain of 2.5 cars. A far greater freight load is hauled with a marked decrease in freight train miles. Economies have been effected, passed on in part to the shippers, in keeping down rates and certainly in bettering deliveries.

Yet this betterment in railroad performance has given rise to a determined movement to impose a new wage burden upon the railroads by various so-called "full crew" laws, and even to limit by statute the number of cars in a train. In Arkansas the attempt to repeal by referendum a statute requiring an extra brakeman on each train made up of more than 25 cars did not succeed.

The argument for larger train crews was that the longer train increases the hazard of accident to trainmen. Yet the *Railway Age* points out that while freight trains have been growing longer the accident rate among trainmen has been growing much smaller. It is not claimed that lengthening a train in itself reduces the hazard. The real reason, perhaps, is that of necessity a long train means rolling stock in first rate condition and therefore less subject to accident. The Government figures show that between the years 1913 and 1924 the number of cars to a train increased 35 per cent while the number of freight trainmen killed per 10 million train miles decreased 70 per cent.

The American public heartily approves any movement tending to make employment in industry safer. But it has little patience with efforts to make by law more jobs than wise management demands. One factor vital to the continued success of our industries is economical transportation. Having succeeded in cutting this cost and in reducing the accident rate, the railroads should not be penalized by the legislation the labor unions have been so quick to demand.

Distribution of Steel Capacity in Europe



BASED on figures compiled by THE IRON AGE, the accompanying map was published by "Industrial Digest" in connection with an article on the European Steel Cartel. Each dot on the map (and in the inserts at the bottom) stands for one per cent of the world's productive capacity in steel ingots and castings.



# Gain in October Pig Iron Output

Estimated Returns Show Daily Rate Increased 2348 Tons or 2.25 Per Cent Over September—Net Gain of 2 Furnaces

DATA collected by wire on Nov. 1 show that a moderate gain was made in the pig iron output for October. With the last two days estimated in most cases by the producing companies, the total was 3,313,623 gross tons, or 106,891 tons per day for the 31 days of October. This is a gain of 2348 tons per day, or 2.25 per cent over September, when the daily rate was 104,543 tons. The October rate is the largest since June and approximates the January rate of 106,974 tons per day.

There were 8 furnaces blown in and 6 blown out or banked, making a net gain of 2 furnaces for the month. This compares with a net gain of 3 furnaces in September. There were 218 furnaces active on Nov. 1 as compared with 216 on Sept. 1.

During the month two new furnaces were put in blast, the new stack of the St. Louis Coke & Chemical Co. at Granite City, Ill., and the new unit of the Central Alloy Steel Co. at Massillon, Ohio.

## Furnaces Blown In and Out

Among the furnaces blown in during October were the No. 2 furnace of the New Jersey Zinc Co. in the Lehigh Valley; the Marietta furnace of E. J. Lavino & Co. in the Lower Susquehanna Valley; No. 5 Carrie furnace of the Carnegie Steel Co. in the Pittsburgh district; No. 2 Ohio furnace of the Carnegie Steel Co. in the Mahoning Valley; the new furnace of the Central Alloy Steel Co. in central Ohio; the Belfont furnace in southern Ohio; the new furnace of the St. Louis Coke & Chemical Co. in Illinois, and No. 1 Bessemer furnace of the Tennessee Coal, Iron & Railroad Co. in Alabama.

Among the furnaces blown out or banked during October were the Sheridan furnace in the Lebanon

Valley; No. 3 and No. 4 Carrie furnaces of the Carnegie Steel Co. in the Pittsburgh district; J furnace at the Cambria plant of the Bethlehem Steel Corporation in western Pennsylvania; No. 5 Ohio furnace of the Carnegie Steel Co. in the Mahoning Valley, and one furnace of the Woodward Iron Co. in Alabama.

## Production by Districts

The estimated October production by districts is given in the table. The complete returns, giving the actual output for all furnaces for the month of October, will be published in THE IRON AGE, Nov. 11.

Pig Iron Production by Districts, Gross Tons

	Oct. (31 days)	Sept. (30 days)	Aug. (31 days)	July (31 days)
New York and Mass.	224,801	211,362	196,706	206,252
Lehigh Valley.....	88,983	77,523	80,506	84,223
Schuylkill Valley...	68,962	65,101	67,550	66,531
Lower Susq. and Lebanon Valleys.	36,047	35,545	35,167	35,945
Pittsburgh district..	728,649	688,000	668,100	622,772
Shenango Valley...	109,434	96,841	108,719	117,504
Western Penna.....	134,123	130,219	127,514	127,622
Maryland, Virginia and Kentucky....	89,612	84,172	85,171	82,963
Wheeling district...	109,241	105,391	108,429	108,110
Mahoning Valley...	340,738	329,488	323,305	317,307
Central and North- ern Ohio.....	344,392	333,951	351,852	348,371
Southern Ohio.....	43,617	38,082	36,071	48,468
Illinois and Indiana	599,555	576,506	644,907	668,564
Mich., Minn., Mo., Wis., Colo. and Utah .....	142,586	127,860	121,357	137,135
Alabama .....	246,883	230,345	238,812	246,124
Tennessee .....	6,000	5,907	6,313	5,447
Total .....	3,313,623	3,136,293	3,200,479	3,223,338

## Gives Lectures on Concrete Structures

SAN FRANCISCO, Oct. 21.—The first of a series of seven free lectures on recent developments in the design of concrete structures and in the mixture and the field control of concrete was held here last night in the auditorium of the Pacific Gas & Electric Co., before a group of local engineers, architects, contractors, building inspectors and others. The course is being given through the Portland Cement Association under the auspices of the San Francisco section of the American Society of Civil Engineers. A. P. Denton, district engineer of the Portland Cement Association, is in charge of arrangements. Engineers from the association's research laboratory at Chicago will be the lecturers.

## Bureau of Standards Studies Electrolytic Zincing

WASHINGTON, Oct. 26.—The Bureau of Standards has just completed an investigation of the baths used in coating by the electrolytic process. Satisfactory zinc coatings may be produced by plating from either acid solutions or alkaline cyanide solutions. The former are cheaper and easier to control but the latter possess better "throwing power" and are therefore especially suited for plating irregularly shaped articles in which there are deep recesses.

An extended study of acid zinc plating baths showed that apparently it is not feasible greatly to increase their throwing power. By the addition of appropriate salts to the solutions of zinc sulphate or zinc chloride, it was found possible to increase greatly their conduc-

tivity and to produce satisfactory deposits at higher current densities, i.e., more rapidly than has usually been feasible in commercial work. Methods were also developed for measuring and controlling the acidity of these zinc plating baths, which has an important effect upon their operations.

A few trials have been made on a commercial scale which indicate that the new type of plating solutions suggested as a result of this study will permit much more rapid zinc plating, especially of small articles such as are usually handled in rotating plating barrels.

## Permanent Exhibits at New Orleans

Among the steel companies which have taken space in the permanent International Trade Exhibition at New Orleans are the United States Steel Products Co., Carnegie Steel Co., American Steel & Wire Co., American Sheet & Tin Plate Co., Illinois Steel Co., Lorain Steel Co., Newport Rolling Mill Co., Lukens Steel Co. Other companies in metalworking lines which have exhibits are the Diebold Safe & Lock Co., Canton, Ohio; the McCray Refrigerator Co., Kendallville, Ind.; the General Electric Co., Schenectady, N. Y., and the International Harvester Co., Chicago.

A steam flow meter, for such uses as ascertaining load distribution in steam lines, discovering leaks or faulty steam operation, has been developed by the Brown Instrument Co., Philadelphia. It works on the induction bridge principle and has thus the electrical advantage of long distance operation.

# Iron and Steel Markets

## Pig Iron Advancing, Steel Quiet

Steel Production Less, as New Buying Declines—  
October Iron Output Slightly Higher—  
Coal Excitement Abating

**P**IG iron and steel markets are at variance, the former being very active at advancing prices due to the flurry in coal, while in finished steel there has been another week of quietness.

Steel production has not been affected as yet to the same extent as order books, but it is evident that November ingot output will show more decline in comparison with October than was seen last month in comparison with September.

In the Pittsburgh and adjoining districts steel production is slightly above 75 per cent of capacity, as against 80 per cent last week and an average of 85 per cent for August and September.

The Steel Corporation's rate is still close to 83 per cent, but is expected to fall off somewhat as the month advances. New business is exceeded by shipments, but owing to very considerable bookings of rails last month the statement of unfilled orders as of Oct. 31 is likely to show some increase.

Pig iron sales reached the largest total in many weeks, consumers being driven into the market by the rapid advance in fuel prices. Sales in the New York district, mostly for the first quarter, were 25,000 tons, and the Eastern Pennsylvania and Boston markets have been likewise active. Northern Ohio furnaces likewise had many inquiries, but because of fuel uncertainties have limited their sales. Prices have advanced 50 cents a ton in Eastern markets and some furnaces quote \$1 a ton higher than a week ago.

At Pittsburgh the excitement in the coal market has abated, owing to the difficulty of getting export permits and the refusal of railroads to take coal subject to reconsignment. The higher wage scale paid in Western Pennsylvania and adjacent fields means 75c. to \$1 a ton increase in coke cost and merchant pig iron producers who buy their coke are putting up pig iron in proportion.

October pig iron output was 3,313,623 tons, or 106,891 tons a day, as against 3,136,293 tons in the 30 days of September, or 104,543 tons a day, the increase in daily rate being 2.25 per cent. These figures indicate that the rate of steel production last month differed but little from that of September.

On Nov. 1 active blast furnaces numbered 218, out of a total of 371, while 216 were in blast on Oct. 1. Eight blew in in the month and 6 blew out. Production is now at about the January rate of 107,000 tons a day, exceeded this year only in March, April and May.

Chicago reports C. & O. and Missouri Pacific rail contracts this week, together making 90,000 tons. Leaving out rail orders, new buying in the Chicago district tapered off rather sharply last month.

Pittsburgh mills find the automobile curtailment the chief factor in the lessened demand; it is not the sole one. Pipe makers are catching up with their obligations. In structural steel the falling off is progressive, and the agricultural situation has not yet cleared enough to decide the steel requirements of the implement companies.

Announcement of tin plate prices for the first half of 1927 will probably be made by another week.

A New London company will build two submarines for Chile, requiring 600 tons of plates and sheets.

Bookings of fabricated steel reported for the week, totaling about 15,000 tons, were the lowest since April. Buying for near-at-hand needs has featured lately even the structural field. Prices of the plain material continue firm, despite the holding off of projects requiring large tonnages.

Exports of machinery during September were valued at \$36,901,003, an increase of \$4,500,000 over August. Chief gains were in mining and quarrying and oil well machinery. Almost \$36,000,000 gain is shown for the first nine months over the corresponding period of 1925.

Monthly shipping records for Lake Superior iron ore were broken in October with a water movement of 9,337,000 tons, bringing the season's total to 54,568,000 tons on Nov. 1. This month's shipments will put 1926 well in advance of 1925, as last year's total was but 54,081,000 tons, of which 4,257,000 tons was moved in November.

The British need of steel is indicated by an inquiry for 1000 tons of blooms. It is estimated that merchants in England have lately sought to cover in the United States for fully 100,000 base boxes of tin plate.

Further improvement in Germany caused the steel syndicate to order an 80 per cent operation for November, following three months at 70 per cent. Exports of pig iron, wire and machinery are increasing. Bounties to exporting manufacturers are now \$4 per ton lower on blooms and \$5.45 per ton on bars, with proportional reductions on other forms of steel. Domestic prices remain unchanged.

THE IRON AGE pig iron composite price advanced to \$20.04 per gross ton from \$19.71, the level for the preceding three weeks. The finished steel composite remains for the fourth week at 2.453c. per lb.



A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics  
At Date, One Week, One Month, and One Year Previous

For Early Delivery

Pig Iron, Per Gross Ton:	Nov. 1, 1926	Oct. 26, 1926	Oct. 5, 1926	Nov. 2, 1925
No. 2 fdy., Philadelphia...	\$22.26	\$21.76	\$21.76	\$22.76
No. 2, Valley furnace....	19.00	18.50	18.50	20.00
No. 2, Southern, Cin'tl...	23.69	23.69	23.69	25.05
No. 2, Birmingham, Ala...	20.00	20.00	20.00	21.00
No. 2 foundry, Chicago*...	21.00	21.00	21.00	22.00
Basic, del'd, eastern Pa...	21.50	21.00	20.75	22.00
Basic, Valley furnace....	18.50	18.00	18.00	19.50
Valley Bessemer del'd P'gh	21.26	21.26	20.76	22.26
Malleable, Chicago* ....	21.00	21.00	21.00	22.00
Malleable, Valley .....	19.00	18.50	18.50	20.00
Gray forge, Pittsburgh...	20.26	19.76	19.76	21.26
L. S. charcoal, Chicago...	27.04	27.04	27.04	29.04
Ferromanganese, furnace.	88.00	88.00	88.00	115.00

Rails, Billets, Etc., Per Gross Ton:	Nov. 1, 1926	Oct. 26, 1926	Oct. 5, 1926	Nov. 2, 1925
O.-h. rails, heavy, at mill.	\$43.00	\$43.00	\$43.00	\$43.00
Light rails at mill.....	36.00	36.00	36.00	36.96
Bess. billets, Pittsburgh...	35.00	35.00	35.00	35.00
O.-h. billets, Pittsburgh...	35.00	35.00	35.00	35.00
O.-h. sheet bars, P'gh....	36.00	36.00	36.00	35.00
Forging billets, base, P'gh	40.00	40.00	40.00	40.00
O.-h. billets, Phila.....	40.30	40.30	40.30	39.30
Wire rods, Pittsburgh....	45.00	45.00	45.00	45.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb..	1.90	1.90	1.90	1.90

Finished Iron and Steel,	Nov. 1, 1926	Oct. 26, 1926	Oct. 5, 1926	Nov. 2, 1925
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.22	2.22	2.22	2.12
Iron bars, Chicago.....	2.00	2.00	2.00	1.90
Steel bars, Pittsburgh...	2.00	2.00	2.00	2.00
Steel bars, Chicago.....	2.10	2.10	2.10	2.10
Steel bars, New York....	2.34	2.34	2.34	2.34
Tank plates, Pittsburgh..	1.90	1.90	1.90	1.80
Tank plates, Chicago.....	2.10	2.10	2.10	2.10
Tank plates, New York....	2.24	2.24	2.24	1.94
Beams, Pittsburgh.....	2.00	2.00	2.00	1.90
Beams, Chicago.....	2.10	2.10	2.10	2.10
Beams, New York.....	2.34	2.34	2.34	2.24
Steel hoops, Pittsburg...	2.50	2.50	2.50	2.50

\*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Sheets, Nails and Wire,	Nov. 1, 1926	Oct. 26, 1926	Oct. 5, 1926	Nov. 2, 1925
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	3.00	3.00	3.00	3.10
Sheets, black, No. 24, Chi-				
cago dist. mill.....	3.20	3.20	3.10	3.20
Sheets, galv., No. 24, P'gh	3.85	3.85	3.85	4.05
Sheets, galv. No. 24, Chi-				
cago dist. mill.....	4.05	4.05	3.95	4.15
Sheets, blue, 9 & 10, P'gh.	2.30	2.30	2.30	2.40
Sheets, blue, 9 & 10, Chi-				
cago dist. mill.....	2.50	2.50	2.40	2.50
Wire nails, Pittsburgh....	2.65	2.65	2.65	2.65
Wire nails, Chicago dist.				
mill .....	2.70	2.70	2.70	2.70
Plain wire, Pittsburgh....	2.50	2.50	2.50	2.50
Plain wire, Chicago dist.				
mill .....	2.55	2.55	2.55	2.55
Barbed wire, galv., P'gh..	3.35	3.35	3.35	3.35
Barbed wire, galv., Chi-				
cago dist. mill.....	3.40	3.40	3.40	3.40
Tin plate, 100 lb. box, P'gh	\$5.50	\$5.50	\$5.50	\$5.50

Old Material, Per Gross Ton:	Nov. 1, 1926	Oct. 26, 1926	Oct. 5, 1926	Nov. 2, 1925
Carwheels, Chicago.....	\$14.50	\$14.50	\$14.50	\$18.00
Carwheels, Philadelphia...	17.00	17.00	17.50	18.50
Heavy melting steel, P'gh.	17.50	17.50	17.00	19.50
Heavy melting steel, Phila.	15.50	16.50	16.50	17.00
Heavy melting steel, Ch'go	13.00	13.00	13.00	16.00
Heavy melting steel, Ch'go	14.50	16.00	16.00	18.00
No. 1 cast, Pittsburgh....	17.50	17.50	17.50	18.00
No. 1 cast, Philadelphia...	16.00	16.50	16.50	18.00
No. 1 cast, Ch'go (net ton)	17.00	17.00	17.00	18.50
No. 1 RR. wrot. Phila....	17.00	17.00	17.00	18.50
No. 1 RR. wrot. Ch'go (net)	12.50	12.75	13.00	15.50

Coke, Connellsville, Per Net Ton at Oven:	Nov. 1, 1926	Oct. 26, 1926	Oct. 5, 1926	Nov. 2, 1925
Furnace coke, prompt....	\$5.00	\$4.00	\$3.50	\$3.00
Foundry coke, prompt....	6.00	5.00	4.50	9.00

Metals,	Nov. 1, 1926	Oct. 26, 1926	Oct. 5, 1926	Nov. 2, 1925
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	14.12½	14.25	14.37½	14.75
Electrolytic copper, refinery	13.75	13.80	14.00	14.50
Zinc, St. Louis.....	7.25	7.22½	7.35	8.67½
Zinc, New York.....	7.00	7.57½	7.70	9.02½
Lead, St. Louis.....	7.90	7.90	8.35	9.50
Lead, New York.....	8.10	8.25	8.65	9.85
Tin (Strait), New York..	(67.50)	69.12½	71.50	63.62½
Antimony (Asiatic), N. Y.	13.25	14.00	13.62½	20.00

Pittsburgh

Advancing Fuel Results in Still Higher  
Pig Iron Prices—Ingot Output Drops

PITTSBURGH, Nov. 1.—A continued narrowing of demand for steel is reflected this week in a rather substantial curtailment of ingot production, which in this and nearby districts is now little more than 75 per cent of capacity, as against 80 per cent last week and 85 per cent, the average for August and September. Loss of business from the automobile industry is the chief factor in this reaction, but it is not the sole one, as the call for finished products not identified with motor car construction also has fallen off. There is a belief that builders of automobiles will be in the market for steel again in the next six weeks, but the present situation is that they are not only buying very sparingly but a number of them have suspended shipments against specified tonnages to begin taking inventories.

Pipe makers are catching up with their obligations. The letdown in structural steel awards is progressive, and the agricultural situation is yet too uncertain for the farm implement manufacturers to move confidently in purchasing steel. The railroad business that was expected to offset smaller demands from other consuming sources has not materialized. It is a quiet market, even when allowance is made for the fact that steel buyers for the past few years have been buying close to their actual requirements and the market at no time has been active in the sense of the term as formerly accepted.

The coal and coke market still attracts attention. While there has been a distinct falling off in the demand for coal and recent excitement has abated, these developments being largely due to the fact that permits for shipments for export are difficult to obtain and railroads are refusing to take coal over the scales subject to reconsignment, prices have weakened only slightly. They remain high enough to permit the operation of union coal mines at wage scales roughly about one-third higher than the non-union mine operators have been paying. Since a week ago the latter have found it necessary to advance wages to the union scale in order to keep their men. All over western Pennsylvania and in adjacent fields, the so-called Jacksonville scale is now in effect, and in a number of cases an even higher scale is being paid. Day labor in the non-union fields is now being paid \$7.50 per day, as against \$5 the former rate, and the various jobs in the mine are commanding a corresponding increase.

This means an increase of about 60c. per ton in the cost of mining coal by those who have been operating on the non-union basis. As yet a reaction to the wage advance has shown only in pig iron, which is held at \$1 a ton above last week's maximum prices. It is figured that the higher scale means an increase in coke-producing costs of from 75c. to slightly more than \$1 a ton, and coke now moving on contracts has been advanced accordingly through the operation of a clause imposing the extra cost upon the buyers. It cannot be said that the advance is established, because there is no great rush of pig iron consumers to buy and many of them are holding off in the belief that when they need iron they will be able to get it at less money than is now wanted. Scrap prices are holding well, although demands are light.

**Pig Iron.**—With a restoration of the Jacksonville wage scale in the Connellsville district, coke moving to the blast furnaces on contracts automatically is advanced in price to the extent of the increased cost of production, and merchant pig iron producers, figuring that this means an advance of \$1 a ton in their coke, have made a similar advance in pig iron. All producers are now quoting \$20, Valley furnace, for No. 2 foundry and malleable iron, \$20.50 for Bessemer and \$19.50 for basic. These prices are as yet merely asking prices. The actual market is 50c. a ton higher on foundry iron, which has been sold in the week under review at \$19, Valley furnace, for No. 2 grade. There are reports of a small sale of basic iron at \$18.50. Interest in the market generally is low, as most consumers can go to the end of the year without additional supplies, and there is a belief among them that the conditions that have brought about the last advance will not hold that long. W. P. Snyder & Co. report the average price of Bessemer iron from Valley furnaces in October, based on sales of 1000 tons or more, at \$19, and of basic at \$18, as compared with \$18.35 and \$17.50 in September.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.76 per gross ton:

Basic .....	\$18.50 to \$19.50
Bessemer .....	19.50 to 20.50
Gray forge .....	18.50 to 19.50
No. 2 foundry .....	19.00 to 20.00
No. 3 foundry .....	18.50 to 19.50
Malleable .....	19.00 to 20.00
Low phosphorus, copper free....	28.00

**Steel and Iron Bars.**—Steel bars are slowing down in sales and specifications. Loss of business from cold-finished bar makers is being felt, and bolt, nut and rivet makers are not moving their products freely enough to be in need of much raw material. Makers still call 2c., base, the minimum price, but are finding it necessary to name that price on small lots, because they need orders. There is little activity in iron bars, and prices are no more than steady.

**Structural Steel.**—The market in large structural shapes reflects the fact that fabricated steel business is light. Inquiries are small even for this time of year, which ordinarily is a quiet period. There is no evidence the mills are going below 2c., base Pittsburgh, on plain material.

**Plates.**—Demand is well below productive capacity, but mills are not so anxious for business that they will go below 1.90c., base Pittsburgh.

**Ferroalloys.**—One domestic producer of ferromanganese has advanced its price to \$100, Atlantic seaboard, for tonnages for shipment over the remainder of the year. As large consumers are covered to the end of the year, the new price will apply merely on the small lots for prompt delivery to buyers who rarely buy much in advance of their actual requirements. Basis for the advance is found in the stronger coke market and the fact that coke moving on contract at prices below those of today goes up on account of the wage increase just announced. Coke contracts in recent years have contained a clause imposing upon buyers any increase in producing costs resulting from wage increases.

New business in ferromanganese and other commonly used ferroalloys is still very light. Prices are given on page 1303.

**Semi-Finished Steel.**—A fairly well sustained movement of wire rods is reported, but in other forms of semi-finished steel the market is quieter, in keeping with a slower market in most finished products. Specifications of strip steel makers are materially smaller, and one company which has been shipping largely billets and slabs for strips has been obliged to cut ingot production by more than 40 per cent. Sheet bars are more easily obtainable by mills that do not depend upon regular sources of supply. A drop in the demand for butt-welded sizes of pipe is reflected in smaller skelp releases, and the curtailment of production by automobile builders is cutting into the demand for forging quality steel. Prices are holding because steel production is being scaled to the level of demand. In this and nearby districts, ingot output is now between 75 and 78 per cent of capacity, against 80 per cent last week and 85 per cent, the August-September average. In the Youngstown district production does not exceed 70 per cent.

**Wire Products.**—There is still a fairly good movement of nails and plain wire, but fence and fencing materials are sluggish and the cut in automobile production is reducing the demand for spring wire. Prices are holding well in this territory, but there are reports of price concessions in some other districts, notably in the South, where there is depression on account of the low price of cotton. Prices are given on page 1301.

**Rails and Track Supplies.**—The strength of the coal market and the fact that there is a steady addition to the number of active mines are creating a lively demand for light rails and small spikes, but business in standard track accessories is still rather light and the buying movement in standard-section rails for 1927 appears to be over. Prices are given on page 1301.

**Tubular Goods.**—A high rate of engagement is still noted among lap-welded pipe furnaces, but with demands somewhat smaller and less urgent, there is a noticeable shortening in delivery promises. Actually, production is somewhat ahead of incoming business in oil and gas well pipe, and if this month sees maintained operations, it will be partly accounted for by the building up of mill stocks. Butt-welded pipe is seasonally slow; jobbers have inventories in mind and are ordering in keeping with actual needs. There is more steadiness to boiler tube prices than there has been in a long time; demand is hardly large, but production has been scaled and pressure to sell is more restrained. Discounts are given on page 1301.

**Tin Plate.**—Export orders and fill-in business from domestic sources are keeping up independent mill operations fairly well, but tinning departments are not so fully engaged, as a good deal of the present demand is for black plates for enameling and other purposes. The orders are for early shipment, and mill scheduling is for short periods. The American Sheet & Tin Plate Co. still has a full physical capacity operation, as it is now producing against advance 1927 business from the

## THE IRON AGE Composite Prices

### Finished Steel

Nov. 1, 1926, 2.453c. Per Lb.

One week ago.....	2.453c.
One month ago.....	2.439c.
One year ago.....	2.424c.
10-year pre-war average.....	1.689c.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 87 per cent of the United States output of finished steel.

	High		Low	
1926	2.453c.	Jan. 5:	2.403c.	May 18
1925	2.560c.	Jan. 6:	2.396c.	Aug. 18
1924	2.789c.	Jan. 15:	2.460c.	Oct. 14
1923	2.824c.	April 24:	2.446c.	Jan. 2

### Pig Iron

Nov. 1, 1926, \$20.04 Per Gross Ton

One week ago.....	\$19.71
One month ago.....	19.63
One year ago.....	20.79
10-year pre-war average.....	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1926	\$21.54,	Jan. 5:	\$19.46,	July 13
1925	22.50,	Jan. 13:	18.96,	July 7
1924	22.88,	Feb. 26:	19.21,	Nov. 3
1923	30.86,	March 20:	20.77,	Nov. 20



# Mill Prices of Finished Iron and Steel Products

## Iron and Steel Bars

### Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mills.....	2.00c. to 2.10c.
F.o.b. Chicago.....	2.10c.
Del'd Philadelphia.....	2.32c.
Del'd New York.....	2.34c.
Del'd Cleveland.....	2.19c.
F.o.b. Birmingham.....	2.15c. to 2.25c.
C.i.f. Pacific ports.....	2.35c.
F.o.b. San Francisco mills.....	2.35c. to 2.40c.

### Billet Steel Reinforcing

F.o.b. Pittsburgh mills.....	2.00c. to 2.10c.
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### Rail Steel

F.o.b. mill.....	1.80c. to 1.90c.
F.o.b. Chicago.....	2.00c.

### Iron

Common iron, f.o.b. Chicago.....	2.00c.
Refined iron, f.o.b. P'gh mills.....	3.00c.
Common iron, del'd Philadelphia.....	2.22c.
Common iron, del'd New York.....	2.24c.

## Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mill.....	1.90c.
F.o.b. Chicago.....	2.10c.
F.o.b. Birmingham.....	2.05c. to 2.15c.
Del'd Cleveland.....	2.09c.
Del'd Philadelphia.....	2.22c.
Del'd New York.....	2.24c.
C.i.f. Pacific ports.....	2.30c.

## Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mill.....	2.00c. to 2.10c.
F.o.b. Chicago.....	2.10c.
F.o.b. Birmingham.....	2.15c. to 2.25c.
Del'd Cleveland.....	2.19c.
Del'd Philadelphia.....	2.22c. to 2.32c.
Del'd New York.....	2.34c.
C.i.f. Pacific ports.....	2.35c.

## Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
All gages, narrower than 6 in., P'gh.....	2.50c.
All gages, 6 in. and wider, P'gh.....	2.30c.
All gages, 6 in. and narrower, Chicago.....	2.60c.
All gages, wider than 6 in., Chicago.....	2.55c.
Cotton ties, f.o.b. Atlantic ports, per bundle of 45 lb.....	\$1.22
Cotton ties, f.o.b. Gulf ports, per bundle of 45 lb.....	1.20

## Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills.....	2.30c. to 2.40c.
Bars, f.o.b. Chicago.....	2.40c.
Bars, Cleveland.....	2.45c.
Shafting, ground, f.o.b. mill.....	*2.55c. to 3.00c.
Strips, f.o.b. Pittsburgh mills.....	3.25c. to 3.50c.
Strips, f.o.b. Cleveland mills.....	3.15c. to 3.40c.
Strips, delivered Chicago.....	3.45c. to 3.70c.
Strips, f.o.b. Worcester mills.....	3.75c.

\*According to size.

## Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails.....	\$2.65
Galv'd nails, 1-in. and longer.....	4.65
Galv'd nails, shorter than 1-in.....	4.90
Galvanized staples.....	3.35
Polished staples.....	3.10
Cement coated nails.....	2.65

### Base Per 100 Lb.

Bright plain wire, No. 9 gage.....	\$2.50
Annealed fence wire.....	2.65
Spring wire.....	3.50
Galv'd wire, No. 9.....	3.10
Barbed wire, galv'd.....	3.35
Barbed wire, painted.....	3.10

Chicago district mill and delivered Chicago prices are \$1 per ton above the foregoing. Birmingham mill prices \$3 a ton higher; Worcester, Mass., mill \$3 a ton higher on production of that plant; Duluth, Minn., mill \$2 a ton higher; Anderson, Ind., \$1 higher.

## Woven Wire Fence

	Base to Retailers Per Net Ton
F.o.b. Pittsburgh.....	\$65.00
F.o.b. Cleveland.....	65.00
F.o.b. Anderson, Ind.....	66.00
F.o.b. Chicago district mills.....	67.00
F.o.b. Duluth.....	68.00
F.o.b. Birmingham.....	69.00

## Sheets

### Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. Pittsburgh.....	2.30c. to 2.40c.
Nos. 9 and 10, f.o.b. Ch'go dist. mill.....	2.50c.
Nos. 9 and 10, del'd Philadelphia.....	2.62c. to 2.72c.
Nos. 9 and 10, f.o.b. Birmingham.....	2.60c. to 2.70c.

### Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh.....	3.00c. to 3.10c.
No. 24, f.o.b. Ch'go dist. mill.....	3.20c.
No. 24, del'd Philadelphia.....	3.32c. to 3.42c.
No. 24, f.o.b. Birmingham.....	3.30c. to 3.40c.

### Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade.....	4.25c.
No. 24, f.o.b. Pittsburgh, B grade.....	4.10c.

### Galvanized

No. 24, f.o.b. Pittsburgh.....	3.85c. to 3.95c.
No. 24, f.o.b. Chicago dist. mill.....	4.05c.
No. 24, del'd Philadelphia.....	4.17c. to 4.32c.
No. 24, f.o.b. Birmingham.....	4.20c. to 4.30c.

### Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh.....	3.15c. to 3.25c.
No. 28, f.o.b. Chicago dist. mill.....	3.25c. to 3.35c.

### Automobile Body Sheets

No. 20, f.o.b. Pittsburgh.....	4.25c.
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### Long Ternes

No. 28, 8-lb. coating, f.o.b. mill.....	4.75c.
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## Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills.....	\$5.50
Standard cokes, f.o.b. Gary and Elwood.....	5.60
Ind.....	5.60

## Terne Plate

(F.o.b. Morgantown or Pittsburgh)  
(Per package, 20 x 28 in.)

8-lb. coating, 100 lb. base.....	\$11.40
8-lb. coating I.C. 11.70	30-lb. coating I.C. 19.45
15-lb. coating I.C. 14.85	40-lb. coating I.C. 21.65

## Alloy Steel Bars

(F.o.b. Pittsburgh or Chicago)

S. A. E. Series Numbers	Base Per 100 Lb.
2100* (1/2% Nickel, 0.10% to 0.20% Carbon)	\$3.20 to \$3.25
2300 (3 1/4% Nickel)	4.35 to 4.50
2500 (5% Nickel)	5.50 to 5.65
3100 (Nickel Chromium)	3.40 to 3.50
3200 (Nickel Chromium)	5.00 to 5.25
3300 (Nickel Chromium)	7.00 to 7.25
3400 (Nickel Chromium)	6.25 to 6.50
5100 (Chromium Steel)	3.40 to 3.50
5200* (Chromium Steel)	7.00 to 7.50
6100 (Chrom. Vanadium bars).....	4.30
6100 (Chrom. Vanad. spring steel).....	3.80
9250 (Silicon Manganese spring steel).....	3.20 to 3.25
Carbon Vanadium (0.45% to 0.55% Carbon, 0.15% Vanad.).....	4.10 to 4.20
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chrom., 0.15 Vanad.).....	4.80
Chromium Molybdenum bars (0.80—1.10 Chrom., 0.25—0.40 Molyb.).....	4.25 to 4.35
Chromium Molybdenum bars (0.50—0.70 Chrom., 0.15—0.25 Molyb.).....	3.40 to 3.50
Chromium Molybdenum spring steel (1—1.25 Chrom., 0.30—0.50 Molybdenum).....	4.50 to 4.75

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2 1/2-in. squares, the price is \$5 a gross ton above the 4 x 4 billet price.

\*Not S. A. E. specifications, but numbered by manufacturers to conform to S. A. E. system.

## Rails

	Per Gross Ton
Standard, f.o.b. mill.....	\$43.00
Light (from billets), f.o.b. mill.....	36.00
Light (from rail steel), f.o.b. mill.....	\$32.00 to \$4.00
Light (from billets), f.o.b. Ch'go mill.....	36.00 to 38.00

## Track Equipment

### (F.o.b. Mill)

	Base Per 100 Lb.
Spikes, 1/2 in. and larger.....	\$2.80 to \$3.00
Spikes, 1/2 in. and smaller.....	2.90 to 3.25
Spikes, boat and barge.....	3.25
Track bolts, all sizes.....	3.90 to 4.50
Tie plates, steel.....	2.25 to 2.35
Angle bars.....	2.75

## Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

### Butt Weld

Inches	Steel	Galv.	Inches	Iron	Galv.
1/2.....	45	19 1/2	1/2 to 3/4.....	22	11
3/4.....	51	25 1/2	3/4.....	28	12
1.....	55	42 1/2	1 to 1 1/2.....	30	12
1 1/2.....	60	48 1/2			
2.....	62	50 1/2			

### Lap Weld

2.....	55	43 1/2	2.....	23	7
2 1/2 to 6.....	59	47 1/2	2 1/2.....	26	11
7 and 8.....	56	43 1/2	3 to 6.....	28	13
9 and 10.....	54	41 1/2	7 to 12.....	26	11
11 and 12.....	53	40 1/2			

### Butt Weld, extra strong, plain ends

1/2.....	41	24 1/2	1/2 to 3/4.....	19	+54
3/4 to 1.....	47	30 1/2	3/4.....	21	7
1.....	53	42 1/2	1.....	23	12
1 1/2.....	58	47 1/2	1 to 1 1/2.....	30	14
2.....	61	50 1/2			

### Lap Weld, extra strong, plain ends

2.....	53	42 1/2	2.....	23	9
2 1/2 to 4.....	57	46 1/2	2 1/2 to 4.....	29	15
4 1/2 to 6.....	56	45 1/2	4 1/2 to 6.....	25	14
7 to 8.....	52	39 1/2	7 to 8.....	21	7
9 and 10.....	45	32 1/2	9 to 12.....	16	2
11 and 12.....	44	31 1/2			

To the large jobbing trade the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1 1/2 points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to large jobbers by one point with supplementary discounts of 5 and 2 1/2%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

## Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel	Charcoal Iron
2 to 2 1/2 in.....	27
2 1/2 to 3 in.....	37
3 in.....	40
3 1/2 to 3 3/4 in.....	42 1/2
4 to 13 in.....	46
1 1/2 in.....	18
2 1/2 to 3 in.....	18
2 to 2 1/2 in.....	2
2 1/2 to 3 in.....	7
3 1/2 to 4 1/2 in.....	9

Beyond the above discounts, 5 to 7 fives extra are given on lap welded steel tubes and 2 tens to 2 tens and 1 five on charcoal iron tubes.

### Standard Commercial Seamless Boiler Tubes

Cold Drawn	Hot Rolled
1 in.....	60
1 1/4 to 1 1/2 in.....	62
1 1/2 in.....	36
2 to 2 1/4 in.....	31
2 1/2 to 2 3/4 in.....	39
3 in.....	45
3 1/4 and 3 1/2 in.....	50
4 in.....	53
4 1/2, 5 and 6 in.....	45

Less carloads, 4 points less. Add \$8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

## Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base.....	55
Carbon, 0.30% to 0.40%, base.....	50
Plus differentials for lengths over 18 ft. and for commercially exact lengths. Warehouse discounts on small lots are less than the above.	

Pacific Coast, amounting to 1,500,000 boxes, which will move to destination this month and next via the Panama Canal. The American Sheet & Tin Plate Co. will probably announce prices for the first half of next year in the next week or 10 days.

**Cold-Finished Steel Bars and Shafting.**—Business still feels the effect of the low rate of automobile production, but there is a common feeling among producers in this district that a base of 2.40c., Pittsburgh, on ordinary tonnages is too low in relation to the price of hot-rolled bars, and there is a general tendency to make a firm stand at that figure.

**Hot-Rolled Flats.**—The new month opens with the smallest order book in strips that makers have had at the beginning of a month this year. This is a reflection of the curtailment of motor car production, which also affects the demand for hoops and bands, which now find a greater call from the automobile builders than they do from the old-time consuming sources. Production is being held in keeping with demand, and prices are holding.

**Cold-Rolled Strips.**—Competition is as sharp as it has been at any time recently, and while 3.25c., base Pittsburgh, is the objective of the mills on the larger lots, it is by no means as low as some mills will go to get a desirable order. Prices on less-than-carload lots range from 3.50c. to 3.60c., base. The decline in motor car production has cut deeply into cold-rolled strip business and into mill operations. This month should tell whether there will be a January recovery in automobile output, as material specified this month would be based on January car sales expectations.

**Bolts, Nuts and Rivets.**—Some of the makers of bolts and nuts who recently showed a disposition to make attractive prices to secure orders are again quoting full prices, presumably because the bar market does not weaken and because they realize that prices are not the sole factor in demand. The lighter demand of the past few weeks has been due to a decline in consumption. For large rivets, \$2.60 base, per 100 lb., Pittsburgh, continues to be merely the small lot price. Prices and discounts are given on page 1303.

**Sheets.**—New business is of rather slim proportions, because of the extended protection given buyers before the September price advances, but specifications against orders in the common finishes are good, running about 80 per cent of capacity with the American Sheet & Tin Plate Co. and relatively as well with the independents. The movement of automobile body sheets is slow and has contracted even more since a week ago, as some automobile companies will take inventories this month and are holding up shipments of specified tonnages. Prices are holding fairly well, but it is natural that makers should be somewhat indifferent to business when they have a fairly good order book and buyers are specifying well. Mill operations are slightly lower, although the leading interest still reports a 90 per cent rate.

**Coal and Coke.**—Higher wage scales in the Connells-ville district have carried coke prices upward approxi-

mately \$1 a ton since a week ago. Because there is more profit in coal than in coke, production of the latter is being held closely to contract requirements and spot offerings are very limited. The demand also is limited, but there have been sales of furnace grade at \$5 to \$5.50 and of foundry coke at from \$6 to \$6.50. It is very difficult to make sales, because those under contract are getting full shipments at lower prices even with the wage advance imposed. Furnace coke contracts for this quarter generally were at \$3, with a few at \$3.25 and \$3.50; with the imposition of the wage advance, shipments against these contracts carry prices 75c. to \$1 a ton more. The coal market is quieter and slightly easier. Against sales of mine run gas coal as high as \$4.50, \$4 is now the ruling maximum, and on other grades \$3.50 is about as high as can be obtained, as against \$4 recently done and still quoted. Prices are given on page 1303.

**Old Material.**—Cast iron scrap in cupola size is stronger as a result of a more widespread demand, due probably to the threat of higher pig iron prices. On other grades, the market is quotable at last week's prices, with demand light but without much pressure to sell. If the present coke market lasts, it should strengthen prices of blast furnace grades of scrap, such as borings and turnings, which are always freely used to maintain pig iron production when economy in coke consumption is necessary. Furthermore, with automobile production down, there is likely to be a decrease in the supply of borings and turnings. The Pennsylvania Railroad scrap list for November amounts to approximately 35,000 gross tons.

We quote for delivery to consumers' yards in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton	
Heavy melting steel.....	\$17.50 to \$18.00
No. 1 yard steel scrap .....	16.50 to 17.00
Scrap rails .....	17.00
No. 1 cast, cupola size.....	16.50 to 17.00
Compressed sheet steel .....	16.00 to 16.50
Bundled sheets, sides and ends..	15.00 to 15.50
Railroad knuckles and couplers..	18.50 to 19.00
Railroad coil and leaf springs..	18.50 to 19.00
Low phosphorus blooms and bil-	
let ends .....	20.00 to 20.50
Low phosphorus mill plates....	19.50 to 20.00
Low phosphorus, light grade....	17.50 to 18.00
Low phosphorus punchings....	18.50 to 19.00
Steel car axles .....	21.50 to 22.00
Cast iron wheels .....	16.00 to 16.50
Rolled steel wheels .....	18.50 to 19.00
Machine shop turnings .....	12.00 to 12.50
Short shoveling steel turnings..	13.50 to 14.00
Sheet bar crops .....	18.00 to 18.50
Heavy steel axle turnings.....	15.50 to 16.00
Short mixed borings and turnings	13.00 to 13.50
Heavy breakable cast .....	15.50 to 16.00
Cast iron borings .....	13.00 to 13.50
No. 1 railroad wrought .....	13.00 to 13.50
No. 2 railroad wrought .....	17.50 to 18.00
Railroad or automobile malleable	
scrap .....	17.00 to 17.50

Cash registers, adding machines, calculating and computing machines and their parts were produced in 1925 to the value of \$98,187,867, an increase of 3.2 per cent as compared with \$95,105,570 in 1923, according to the biennial census of manufactures. The value of radio apparatus manufactured in 1925 was \$170,397,572, an increase of 215.5 per cent as compared with \$54,000,470 in 1923, the last preceding census year.

September shipments of galvanized sheet metal ware, as reported by twelve concerns comprising a large proportion of the industry, were 183,551 dozens, valued at \$746,757, as compared with 177,234 dozens, valued at \$706,238 in August. The galvanized ware included in this summary is the product resulting from dipping made-up shapes in molten zinc and not utensils of galvanized sheets.

Mechanical stokers to the number of 127 rated for 44,211 hp., were sold in September, according to reports to the Department of Commerce from twelve establishments. Sales in August amounted to 104 stokers of 38,852 hp. Sales for the nine months of this year called for 443,000 hp. compared with 419,000 hp. for the same period of 1925.

#### Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Tank plates .....	3.00c.
Structural shapes .....	3.00c.
Soft steel bars and small shapes.....	2.90c.
Reinforcing steel bars.....	2.90c.
Black sheets (No. 24 gage), 25 or more	
bundles .....	3.95c.
Galvanized sheets (No. 24 gage), 25 or	
more bundles .....	4.70c.
Blue annealed sheets (No. 10 gage), 25 or	
more sheets .....	3.40c.
Cold-finished shafting and screw stock—	
Rounds and hexagons.....	3.60c.
Squares and flats.....	4.10c.
Bands .....	3.60c.
Spikes, large .....	3.30c.
Small .....	3.80c. to 5.25c.
Boat .....	3.80c.
Bolts, track .....	4.90c.
Wire, black soft annealed, base per 100 lb.	\$3.00
Wire, galvanized soft, base per 100 lb....	3.00
Common wire nails, per keg.....	3.00
Cement coated nails, per keg.....	3.05



# Semi-Finished Steel, Raw Materials, Bolts and Rivets

## Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

### Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and over.....	\$35.00
Rerolling, under 4-in. to and including 1½-in. ....	36.00
Forging, ordinary .....	40.00
Forging, guaranteed .....	45.00

### Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer.....	\$36.00

### Slabs

	Per Gross Ton
8 in. x 2 in. and larger.....	\$35.00
Smaller than 8 in. x 2 in. ....	36.00

### Skelp

	Per Lb.
Grooved .....	1.90c.
Sheared .....	1.90c.
Universal .....	1.90c.

### Wire Rods

	Per Gross Ton
*Common soft, base.....	\$45.00
Screw stock .....	\$5.00 per ton over base
Carbon 0.20% to 0.40% ..	3.00 per ton over base
Carbon 0.41% to 0.55% ..	5.00 per ton over base
Carbon 0.56% to 0.75% ..	7.50 per ton over base
Carbon over 0.75% .....	10.00 per ton over base
Acid .....	15.00 per ton over base

\*Chicago mill base is \$46. Cleveland mill base, \$45.

## Prices of Raw Materials

### Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron.....	\$4.55
Old range non-Bessemer, 51.50% iron.....	4.40
Mesabi Bessemer, 51.50% iron.....	4.40
Mesabi non-Bessemer, 51.50% iron.....	4.25
High phosphorus, 51.50% iron.....	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algerian.....	9.50c. to 10c.
Iron ore, Swedish, average 66% iron.....	9.50c.
Manganese ore, washed, 51% manganese, from the Caucasus .....	40c. to 42c.
Manganese ore, high grade, nominal.....	35c. to 44c.
Tungsten ore, high grade, per unit, in 60% concentrates .....	\$11.75 to \$12.50

Chrome ore, Indian basic, 48% Cr<sub>2</sub>O<sub>3</sub>, crude, c.i.f. Atlantic seaboard .....

	Per Lb.
Molybdenum ore, 85% concentrates of MoS <sub>2</sub> , delivered .....	50c. to 55c.

### Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt .....	\$5.00 to \$5.50
Foundry, f.o.b. Connellsville prompt .....	6.00 to 6.50
Foundry, by-product, Ch'go ovens .....	9.75
Foundry, by-product, New England, del'd .....	13.00
Foundry, by-product, Newark or Jersey City, delivered.....	10.59 to 11.77
Foundry, Birmingham .....	5.50 to 6.00
Foundry, by-product, St. Louis or Granite City .....	10.00

### Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines .....	\$3.50 to \$4.00
Mine run coking coal, f.o.b. W. Pa. mines .....	3.00 to 4.00
Mine run gas coal, f.o.b. Pa. mines .....	3.75 to 4.25
Steam slack, f.o.b. W. Pa. mines.....	2.75 to 3.00
Gas slack, f.o.b. W. Pa. mines.....	3.00 to 3.25

### Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd.....	\$88.00 to \$100.00
Foreign, 80%, Atlantic or Gulf port, duty paid .....	\$88.00 to \$100.00

### Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21% .....	\$32.00 to \$34.00
Domestic, 16 to 19% .....	31.00 to 33.00

### Electric Ferrosilicon

	Per Gross Ton Delivered
50% .....	\$85.00 to \$87.50
75% .....	145.00 to 150.00
	Per Gross Ton Furnace
10% .....	\$35.00
11% .....	37.00
12% .....	39.00
14 to 16% .....	\$45 to 46.00

### Bessemer Ferrosilicon

	Per Gross Ton
F.o.b. Jackson County, Ohio Furnace .....	\$33.00
10% .....	35.00
11% .....	37.00
12% .....	39.00

### Silvery Iron

	Per Gross Ton
F.o.b. Jackson County, Ohio Furnace .....	\$25.50
6% .....	26.50
7% .....	27.50
8% .....	29.00
9% .....	29.00
	Per Gross Ton
10% .....	\$31.00
11% .....	33.00
12% .....	35.00

### Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd .....	\$1.05 to \$1.10
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads .....	11.50c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace .....	\$3.25 to \$4.00
Ferrocobaltititanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads.....	\$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per net ton.....	\$91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per net ton.....	\$122.50

### Fluxes and Refractories

#### Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines.....	\$18.00
No. 2 lump, Illinois and Kentucky mines.....	\$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid, .....	\$17.00 to \$17.50
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines.....	\$32.50

#### Fire Clay

	Per 1000 f.o.b. Works
High Duty .....	
Moderate Duty .....	
Pennsylvania .....	\$40.00 to \$43.00
Maryland .....	43.00 to 46.00
New Jersey .....	55.00 to 75.00
Ohio .....	40.00 to 43.00
Kentucky .....	40.00 to 43.00
Illinois .....	40.00 to 43.00
Missouri .....	40.00 to 43.00
Ground fire clay, per ton.....	6.50 to 7.50

#### Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania .....	\$40.00 to \$43.00
Chicago .....	52.00
Birmingham .....	50.00
Silica clay, per ton.....	\$8.00 to 9.00

#### Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa. ....	\$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa. ....	40.00

#### Chrome Brick

	Per Net Ton
Standard size .....	\$45.00

## Mill Prices of Bolts, Nuts, Rivets and Set Screws

### Bolts and Nuts

(Less-than-Carload Lots)

(F.o.b. Pittsburgh, Cleveland, Birmingham and Chicago)

	Per Cent Off List
Machine bolts, small, rolled threads.....	60 and 10
Machine bolts, all sizes, cut threads.....	50, 10 and 10
Carriage bolts, smaller and shorter, rolled threads .....	50, 10 and 10
Carriage bolts, cut threads, all sizes.....	50 and 10
Eagle carriage bolts.....	65 and 10
Lag bolts .....	60, 10 and 10
Plow bolts, Nos. 3 and 7 heads.....	50 and 10
(Extra of 20% for other style heads)	
Machine bolts, c.p.c. and t. nuts, ½ x 4 in., 45, 10 and 5 .....	
Larger and longer sizes.....	45, 10 and 5
Bolt ends with hot-pressed nuts.....	50, 10 and 10
Bolt ends with cold-pressed nuts.....	45, 10 and 5
Hot-pressed nuts, blank and tapped, square, 4.00c. per lb. off list .....	
Hot-pressed nuts, blank or tapped, hexagons, 4.40c. per lb. off list .....	
C.p.c. and t. square or hex. nuts, blank or tapped .....	4.10c. per lb. off list
Washers* .....	6.75c. to 6.50c. per lb. off list

\*F.o.b. Chicago and Pittsburgh.  
The discount on machine, carriage and lag bolts is 5 per cent more than above for car lots. On hot-pressed and cold-pressed nuts the discount is 25c. more per 100 lb. than quoted above for car lots.

### Bolts and Nuts

(Quoted with actual freight allowed up to but not exceeding 50c. per 100 lb.)

	Per Cent Off List
Semi-finished hexagons nuts:	
½ in. and smaller, U. S. S. ....	80, 10 and 5
¾ in. and larger, U. S. S. ....	75, 10 and 5
Small sizes, S. A. E. ....	80, 10, 10 and 5
S. A. E., ½ in. and larger.....	75, 10, 10 and 5
Stove bolts in packages.....	80, 10 and 5
Stove bolts in bulk.....	80, 10, 5 and 2½
Tire bolts .....	60 and 5

### Semi-Finished Castellated and Slotted Nuts

(Actual freight allowed up to but not exceeding 50c. per 100 lb.)

(To jobbers and consumers in large quantities)

	Per 100 Net S.A.E. U.S.S.	Per 100 Net S.A.E. U.S.S.
½-in.....	\$0.44	\$0.44
¾-in.....	0.515	0.515
1-in.....	0.62	0.66
1½-in.....	0.70	0.90
2-in.....	1.01	1.05
2½-in.....	1.38	1.42
3-in.....	1.70	1.73
¾-in.....	\$2.35	\$2.40
1-in.....	2.60	2.60
1½-in.....	5.65	6.80
2-in.....	8.90	8.90
2½-in.....	12.60	13.10
3-in.....	18.55	18.55
3½-in.....	21.00	21.00

Larger sizes.—Prices on application.

### Large Rivets

Base Per 100 Lb.

F.o.b. Pittsburgh.....	\$2.45 to \$2.60
F.o.b. Cleveland .....	2.70
F.o.b. Chicago .....	2.60 to 2.75

### Small Rivets

Per Cent Off List

F.o.b. Pittsburgh.....	70, 10 and 5 to 70 and 10
F.o.b. Cleveland .....	70, 10 and 5 to 70 and 10
F.o.b. Chicago .....	70, 10 and 5 to 70 and 10

### Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb.)

	Per Cent Off List
Milled cap screws.....	80 and 10
Milled standard set screws, case hardened, .....	80 and 5
Milled headless set screws, cut thread.....	80
Upset hex. head cap screws, U. S. S. thread, .....	80, 10 and 10
Upset hex. cap screws, S.A.E. thread, .....	80, 10 and 10
Upset set screws .....	80, 10 and 5
Milled studs .....	70 and 5

## Chicago

### St. Louis Pig Iron Invades Local Market —120,000 Tons of Rails Booked

CHICAGO, Nov. 1.—The feature of this market is rail buying, 120,000 tons of standard sections having been placed this week with Western mills. Two railroads, the Chesapeake & Ohio and the Missouri Pacific, together contracted for 90,000 tons. Most of the larger Western railroads have placed their rail requirements, and buying will now taper off and will be confined largely to tonnages to be placed by the smaller railroads. All told, this has been a good rail year for Western producers, who estimate that by the end of 1926 over 800,000 tons will have been shipped from their mills.

The market in general is characterized by an attitude of watchful waiting. Users are resisting prices but are not tempting mills with sizable tonnages, since the annual inventory period is close at hand and stocks are being allowed to dwindle to a low level. If rails are considered, sales for October were 35 per cent ahead of those for September, but omitting rail tonnages, new business declined rather sharply. Exclusive of track supplies, specifications are holding up well and show only a slight recession from the average rate of September.

**Pig Iron.**—Sales of pig iron produced south of Chicago are being made in Rockford, Freeport and other western Illinois cities at prices which figure back to \$20.88, Chicago furnace, or \$19.76, St. Louis district furnace. This business includes 1000 tons of foundry iron sold to the National Sewing Machine Co., Belvidere, Ill., 1000 tons to a Freeport user and a total of 1000 tons to two melters at Rockford. Chicago producers claim to be holding firmly to the \$21, base furnace. Stocks of low phosphorus iron are running low, and local dealers are now quoting \$31.50 to \$32.50, delivered. Charcoal iron is fairly active, and the price is steady following the recent cut of \$2 a ton.

Quotations on Northern Foundry, high phosphorus and malleable iron are f.o.b. local furnace, and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards:

Northern No. 2 foundry, sil. 1.75 to 2.25	\$21.00
Northern No. 1 foundry, sil. 2.25 to 2.75	21.50
Malleable, not over 2.25 sil.	21.00
High phosphorus	21.00
Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	27.04
Southern No. 2 (all rail)	26.01
Southern No. 2 (barge and rail)	24.18
Low phos., sil. 1 to 2 per cent, copper free	\$31.50 to 32.50
Silvery, sil. 8 per cent	32.29
Bessemer ferrosilicon, 14 to 15 per cent	45.79

**Ferromanganese.**—The market, on the whole, is quite, and sales are reported only in ferromanganese, which is now being quoted at \$95 to \$100, seaboard, or \$102.56 to \$107.56, delivered Chicago.

We quote 80 per cent ferromanganese, \$95.56 to \$107.56, delivered Chicago; 50 per cent ferrosilicon, \$85, delivered; spiegelisen, 18 to 22 per cent, \$40.76 to \$41.76, delivered Chicago.

**Plates.**—Railroad car buying is disappointing, and were it not for the unusual tonnage of tanks coming into this market, plate mills would be hard pressed for business. The St. Paul inquiry for 1000 automobile and 500 stock cars is said to be active, but no action has been taken by the Chicago & North Western on the cars which were authorized several weeks ago. Tanks placed this week total 6000 tons. All are for erection in the Panhandle district of Texas. Inquiry for tankage is lighter than a week ago but still represents a round tonnage. Although the price situation cannot be characterized as strong, there is no evidence at hand that local business is being taken at less than 2.10c., Chicago.

The mill quotation on plates is 2.10c. per lb., base, Chicago.

**Sheets.**—Specifications are holding up well and are keeping Chicago mill operations close to capacity.

New business is light, and some resistance to prices is being encountered. It is reported here that at Minneapolis business is being taken at 3.10c., base, Chicago mill for black sheets, and at 2.40c. for blue annealed. In the Chicago territory no evidence is at hand that price cutting has actually taken place. Business is well distributed in all lines, but the lighter gages are more active than heavier sheets.

Chicago delivered prices from mill are 3.25c. for No. 24 black; 2.55c. for No. 10 blue annealed; 4.10c. for No. 24 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

**Structural Material.**—A fair number of small tonnage contracts are being placed from day to day. In fact, they have been numerous enough of late to encourage fabricators in the belief that the late fall months will not be so slow as at first anticipated. Bookings at Chicago shops average four to five weeks. Fresh inquiry is more active. Five hundred tons has come into this market for the replacement of bridge tramways destroyed by the recent storm at Havana, Cuba. With mills making prompt shipments of plain material and shops not heavily booked, there is a tendency for contractors to delay placing orders. The State Bank of Chicago building, 8000 tons, has not been awarded, although the site is cleared and the construction of the foundations is under way. A hotel at Aurora, Ill., will require 1200 tons, and a theater at Kankakee, Ill., 400 tons.

The mill quotation on plain material is 2.10c. per lb. base, Chicago.

**Bars.**—Specifications for soft steel bars show slight improvement, in spite of the fact that the demand from makers of automobiles and automotive parts has fallen off. At the moment, orders passed on to the mills are larger than shipments. On the other hand, new business is light. New commitments in October were well below those for September, and November buying starts at a rate below the average for the past month. Demand from makers of agricultural machinery has improved, and reports concerning that industry are more optimistic both as regards the immediate future and the early part of next year. Farm machinery plants are now larger users of bars than the makers of automobile parts. Buyers in some quarters are offering strong resistance to present prices, but the market is still holding at 2.10c., Chicago. Demand for rail steel bars is lighter, but both mills at Chicago Heights continue on double turn. Both sales and specifications at the moment are smaller than production. Bed makers have issued larger specifications this week for tubes, although their shipping orders for angles are in unchanged volume. Manufacturers of barn equipment are buying only small quantities of rail steel, inasmuch as their active season is practically at a close. Shipments of fence posts are considerably lighter, never having fully recovered from the setback resulting from unseasonable weather early in the fall. Contractors anxious to finish projects under way are pressing rail steel mills for shipments of reinforcing bars. One mill has found it necessary to put on a double shift in its bending shop. Rail steel bars are steady at 2c., Chicago. Occasionally higher prices are obtained on small tonnages of concrete bars.

Mill prices per lb. are: Mild steel bars, 2.10c.; base, Chicago; common bar iron, 2c. base, Chicago; rail steel bars, 2c., base, Chicago.

**Rails and Track Supplies.**—Fall specifications to Chicago mills for standard-section rails are larger and have come out earlier than usual. The independent mill is operating full and the Steel Corporation, with specifications sufficient for heavy operations until the first of the year, is speeding up production. New business taken by Chicago mills this week aggregates 120,000 tons, bringing the total bookings so far this fall up to more than 500,000 tons. Mills estimate that from 75,000 to 100,000 tons is still to be placed, this being their estimate of requirements of smaller railroads. The Detroit & Toledo Shore Line is asking for 1000 tons of rails and another railroad operating in that territory will take 3000 tons. The Santa Fe has placed 15,000 tons with the Inland Steel Co., this being in addition to the 130,000 tons divided between two other mills on Oct. 16. The Chesapeake & Ohio



has placed 45,000 tons, 50 per cent of which came to Western makers. The Missouri Pacific has contracted for 45,000 tons, of which 20,000 went to the Tennessee Coal, Iron & Railroad Co., 12,000 to the Inland Steel Co. and 13,000 to the Illinois Steel Co. The Missouri Pacific inquiry for 12,000 tons of tie plates is still open. The Pennsylvania has placed 1000 tons of tie plates of special design and analysis with a Western maker. In spite of greater activity in the coal industry there is little demand for light rails.

Standard Bessemer and open-hearth rails, \$43; light rails, rolled from billets, \$36 to \$38 per gross ton, f.o.b. maker's mill.

Standard railroad spikes, 2.90c. per lb. mill; track bolts with square nuts, 3.90c. mill; steel tie plates, 2.35c. mill; angle bars, 2.75c. mill.

**Bolts, Nuts and Rivets.**—Prices are strong and unchanged. Specifications from the trade as a whole are characterized by makers as satisfactory, but October, which proved about equal to September in bookings, was not as good as the corresponding month a year ago. The stove industry in this territory is dull, and shipments to automobile makers are considerably lighter. Specifications from farm implement manufacturers are a trifle larger but not up to those of last year. Operations in the bolt, nut and rivet industry are not over 70 per cent of capacity.

**Cast Iron Pipe.**—Detroit will open bids on Nov. 8 on 2200 tons of 6-in. Class B pipe. It is understood that Toledo will divide 900 tons of 4 to 24-in. Class B and C pipe between three foundries. Contracts will be formally placed Nov. 3. Sheboygan Falls, Wis., will close this week for 250 tons of 6-in. Class B pipe, and Portsmouth, Ohio, is asking bids on 170 tons of 10-in., 68 tons of 8-in. and 130 tons of 6-in. Class C pipe and 12 tons of fittings. The National Cast Iron Pipe Co. has taken 300 tons of 6-in. Class B pipe for Harvey, Ill. Shipments into this territory are heavy, those of October having been close to those of September. Deliveries are slowly improving. The average on 4 and 6-in. pipe is about 30 days, and 10-in. can be obtained in 40 days. Orders from small municipalities are fairly numerous, and there is a noticeable increase in the demand from private buyers.

We quote per net ton, delivered, Chicago, as follows: Water pipe, 4-in., \$51.20 to \$52.70; 6-in. and over, \$47.20 to \$48.70; Class A and gas pipe, \$4 extra.

**Coke.**—Prices on by-product foundry coke are strong and shipments are going forward at the full capacity of local ovens.

**Cold-Rolled Strip.**—The market has gained some strength, and the minimum going price is now \$3.15c., base Cleveland. Chicago delivered prices range from 3.45c. to 3.70c., depending upon the attractiveness of the business offered.

**Wire Products.**—Demand from the jobbing trade is spotty, and while October was a fair month, it was not up to the expectations of mills, and was a trifle below the preceding month in business booked. Mill stocks are being allowed to diminish, and the general scale of mill operations is slightly below that of a week ago. Reports from jobbers in the Northwest, particularly around Minneapolis, are more favorable, and the same

is true of Oklahoma and the oil fields of the Southwest, but where cotton is the staple crop, conditions show no improvement. Specifications from the manufacturing trade are lighter, those for October being below those of September and of October a year ago.

**Reinforcing Bars.**—Inquiry is more active and awards are more numerous, but for the most part they average well below 100 tons each. Dealers expect a good tonnage will be required for the Shedd Aquarium, a \$3,000,000 project, the plans for which have just been completed. Sedimentation tanks for the West Side sewage treating plant, Chicago, will be built by the T. J. Forschner Construction Co. of this city. The project is expected to call for more than 3750 tons of reinforcing bars. Contractors anxious to complete projects under way are pressing bar shops for delivery, with the result that shipments held up well last month, although they did not equal those of October, 1925. Shops, however, are not operating above 75 per cent of capacity. The price situation on billet bars from warehouse shows little change. It is not denied that awards as small as 50 tons each are being taken close to 2.30c., warehouse. Larger tonnages can be had at 2.25c. Lettings and fresh inquiries are shown on page 1314.

**Old Material.**—The market has reached a stage where prices are holding, and changes this week are based upon actual sales, whereas quotations a week ago were largely nominal owing to a lack of transactions. The trade believes that prices will now hold until winter weather slows up scrap yard operations, with a resulting stiffening in the market. Reports as to stocks of scrap in the hands of users vary. However, it is rather generally agreed that mills are well supplied, but that foundries are working close to their actual requirements. Stocks in the hands of dealers are said to be large; one estimate regarded as reasonably accurate places the total at 100,000 tons in the immediate Chicago territory. Buyers, particularly smaller consumers, are placing orders cautiously. A small tonnage of heavy melting steel was sold during the week, sales being reported both at \$13.50 and \$13.75. There is little doubt, however, that the bulk of the tonnage was placed at the lower figure. The Inland Steel Co. is reported to have taken a small tonnage at \$13.75, but as that company's specifications are unusually rigid, the price paid is not regarded as indicating an advance in the market. Brokers continue to trade in heavy melting steel at \$13 to \$13.25 per gross ton.

We quote delivered in consumers' yards, Chicago and vicinity, all freight and transfer charges paid for all items, except relaying rails, including angle bars to match, which are quoted f.o.b. dealers' yards:

#### Per Gross Ton

Heavy melting steel	\$13.00 to \$13.50
Frogs, switches and guards, cut apart, and miscellaneous rails	14.50 to 15.00
Shoveling steel	13.00 to 13.50
Hydraulic compressed sheets	11.50 to 12.00
Drop forge flashings	9.50 to 10.00
Forged cast and rolled steel car wheels	16.50 to 17.00
Railroad tires, charging box size	17.50 to 18.00
Railroad leaf springs, cut apart	16.50 to 17.00
Steel couplers and knuckles	15.50 to 16.00
Coil springs	17.25 to 17.75
Low phosphorus punchings	16.00 to 16.50
Axle turnings, foundry grade	13.00 to 13.50
Axle turnings, blast fur. grade	9.50 to 10.00
Relaying rails, 56 to 60 lb.	25.50 to 26.50
Relaying rails, 65 lb. and heavier	26.00 to 31.00
Rerolling rails	16.50 to 17.00
Steel rails, less than 3 ft.	16.25 to 16.75
Iron rails	13.50 to 14.00
Cast iron borings	9.00 to 9.50
Short shoveling turnings	9.00 to 9.50
Machine shop turnings	6.50 to 7.00
Railroad malleable	16.50 to 17.00
Agricultural malleable	15.00 to 15.50
Angle bars, steel	15.00 to 15.50
Cast iron car wheels	14.50 to 15.00

#### Per Net Ton

No. 1 machinery cast	16.00 to 16.50
No. 1 railroad cast	15.50 to 16.00
No. 1 agricultural cast	15.50 to 16.00
Stove plate	14.00 to 14.50
Grate bars	13.50 to 14.00
Brake shoes	13.00 to 13.50
Iron angle and splice bars	14.00 to 14.50
Iron arch bars and transoms	13.75 to 13.25
Iron car axles	22.00 to 22.50
Steel car axles	17.00 to 17.50
No. 1 railroad wrought	12.50 to 13.00
No. 2 railroad wrought	11.50 to 12.00
No. 1 busheling	10.25 to 10.75
No. 2 busheling	6.25 to 6.75
Locomotive tires, smooth	16.00 to 16.50
Pipes and flues	9.00 to 9.50

#### Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Mild steel bars	3.00c.
Reinforcing bars, billet steel	2.25c. to 2.60c.
Cold-finished steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Hoops	4.15c.
Bands	3.65c.
No. 24 black sheets	3.95c.
No. 10 blue annealed sheets	3.50c.
No. 24 galvanized sheets	4.80c.
Standard railroad spikes	3.55c.
Track bolts	4.55c.
Structural rivets	3.50c.
Boiler rivets	3.70c.
	Per Cent Off List
Machine bolts	50 and 5
Carriage bolts	47½
Coach or lag screws	55 and 5
Hot-pressed nuts, square, tapped or blank	3.25c. off per lb.
Hot-pressed nuts, hexagons, tapped or blank	3.75c. off per lb.
No. 8 black annealed wire, per 100 lb.	\$3.30
Common wire nails, base, per keg	3.05
Cement coated nails, base, per keg	3.05

## New York

### Pig Iron Buying Heavy—Steel Firm on Diminished Demand

NEW YORK, Nov. 1.—The rapid advance in fuel prices has driven pig iron buyers into the market, and sales by local brokers during the week totaled 25,000 tons. A large proportion of this tonnage was placed for delivery in the first quarter, and in some cases through the first half of next year. Close to half of the tonnage placed in this market in the past seven days went to Buffalo furnaces. Since a wage clause is contained in furnace coke contracts, the recent advances in wages at the coal mines will be translated into higher fuel costs at blast furnaces. Recent sales of eastern Pennsylvania iron have been made at \$21.50, base furnace, for foundry iron, but further advances of 50c. to \$1 have been announced, and one or two furnaces have withdrawn from the market. Meanwhile, Buffalo foundry iron at \$19, base furnace, is in a favorable competitive position. Although prices on domestic iron are advancing, there are no present indications that foreign iron will again become a factor in this market. Sales are few, and there are practically no offerings by importers. The Burnham Boiler Corporation, Irvington, N. Y., has closed for 2000 tons of foundry for first quarter delivery at its Lancaster, Pa., and Elizabeth, N. J., plants. Louis Sacks, Inc., Newark, N. J., has closed against its inquiry for 1200 tons of foundry and malleable for first half shipment. The Thatcher Furnace Co., New York, has bought 3000 tons of No. 2 plain and No. 1X foundry for first quarter. The Essex Foundry, Newark, has purchased 2000 to 3000 tons of foundry. The American Locomotive Co., New York, has bought 100 tons of special foundry iron for Dunkirk, N. Y., and is in the market for 250 to 300 tons of low phosphorus for Chester, Pa. Jackson County, Ohio, producers of silvery iron and Bessemer ferrosilicon, have advanced prices \$1 a ton, effective today. The Port Henry, N. Y., furnace is scheduled to resume operations Nov. 20.

We quote per gross ton delivered in the New York district as follows, having added to furnace prices \$1.39 to \$2.52 freight from eastern Pennsylvania. \$4.91 from Buffalo and \$5.54 from Virginia:

East Pa. No. 2 fdy., sil. 1.75 to 2.25	\$23.89 to \$24.02
East Pa. No. 2X fdy., sil. 2.25 to 2.75	24.39 to 24.52
East Pa. No. 1X fdy., sil. 2.75 to 3.25	24.89 to 25.02
Buffalo fdy., sil. 1.75 to 2.25 (all rail)	23.91
No. 2 plain fdy., sil. 1.75 to 2.25 (by barge, del'd alongside in lighterage limits, N. Y. and Brooklyn)	21.00
No. 2 Virginia fdy., sil. 1.75 to 2.25	27.54 to 28.04

**Ferroalloys.**—In a market which has been distinguished by its quietness for many weeks, the sale of 2000 tons of ferromanganese the past week stands out prominently. Nearly all of this was stated to be for shipment this year, and most of it was sold at \$100. It is believed that no more alloy is available at less than \$100, seaboard or furnace. Sellers state that contracts are not being taken for next year's delivery, but it is noticeable that purchases just made will extend over into next year, so far as their consumption is concerned. Inquiries for several hundred tons of spiegeleisen are before the market, otherwise conditions are very quiet, with prices firm and unchanged.

**Reinforcing Bars.**—The last week of the month was featured by the placing of a large number of small tonnages and the appearance of more sizable inquiries than have come into the market since mid-summer. A highway viaduct in Newark will take 1000 tons of bars, which will likely be bought this fall, and an automobile service station in Manhattan will require approximately 900 tons. Several other pending jobs will take from 100 to 300 tons. For a factory building in Hoboken 330 tons was placed in the last week. Prices continue firm at 2c., Pittsburgh, for lots of more than 100 tons, and 2.10c. for small lots. Local warehouses are quoting 3.15c., delivered at job, while the Youngstown ware-

house price remains unchanged at 2.50c., or 2.87½c., delivered New York.

**Finished Material.**—New orders for early delivery plus specifications on contracts total for October from 10 to 30 per cent below the volume of September. Bars and sheets have been specified relatively less than have other forms of steel. There is a pronounced effort to reduce stocks to the lowest possible terms. To what extent forward commitments, as for bars, are withheld in an effort to get price concessions is not clear, but there is a belief that buyers, even of structural steel, are holding off with the hope of securing lower mill prices. At the moment prices are firm. This applies to plates, on which demand, while notably large for October, is not up in the East to the country's consumption in general, which, it is interesting to add, is expected to show a record for the year. Structural steel buying in the last month was marked by the large amount taken for near-at-hand consumption, so that

### Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.34c.
Soft steel bars and small shapes	3.24c.
Iron bars	3.24c.
Iron bars, Swedish charcoal	7.00c. to 7.25c.
Cold-finished steel shafting and screw stock—	
Rounds and hexagons	4.00c.
Flats and squares	4.50c.
Cold-rolled strip, soft and quarter hard	6.25c.
Hoops	4.49c.
Bands	3.99c.
Blue annealed sheets (No. 10 gage)	3.89c.
Long terme sheets (No. 24 gage)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galvanized annealed	5.15c.
Tire steel, 1½ x ¼ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases	4.50c. to 7.00c.

### Per Cent Off List

Machine bolts, cut thread	40 and 10
Carriage bolts, cut thread	30 and 10
Coach screws	40 and 10
Boiler Tubes—	Per 100 Ft.
Lap welded steel, 2-in.	\$17.33
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00

### Discounts on Welded Pipe

Standard Steel—	Black	Galv.
½-in. butt	46	29
¾-in. butt	51	37
1-in. butt	53	39
2½-6-in. lap	48	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
½-in. butt	4	+19
¾-in. butt	11	+9
1-1½-in. butt	14	+6
2-in. lap	5	+14
3-6-in. lap	11	+6
7-12-in. lap	3	+16

### Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box	\$6.45	\$6.20
Charcoal, per box—	A	AAA
IC	\$9.70	\$12.10
IX	12.00	14.25
IXX	13.90	16.00

### Terne Plate (14 x 20 in.)

IC—20-lb. coating	\$10.00 to \$11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

### Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	4.15c.
No. 22	4.30c.
No. 24	4.35c.
No. 26	4.45c.
No. 28*	4.60c.
No. 30	4.85c.

### Sheets, Galvanized

	Per Lb.
No. 14	4.50c. to 4.75c.
No. 16	4.60c. to 4.85c.
No. 18	4.75c.
No. 20	4.90c.
No. 22	4.95c.
No. 24	5.10c.
No. 26	5.35c.
No. 28*	5.60c.
No. 30	6.00c.

\*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.



it is believed October in fabricated steel will not be far behind September. Among developments were increasing requests from England for steel needed against contracts which cannot be filled with British steel. For example, following the inquiries for 100,000 base boxes of tin plate, more or less, coming from England, was a 1000-ton inquiry for soft steel blooms 6 and 8 in. square for Manchester. The export demand is sufficiently strong to allow for a sale of tin plate at \$5 per box for immediate shipment to Denmark against \$4.60, which has been done on export tin plate. American metal, including 600 tons of plates and sheets, will be required for two submarines for Chile to be built by the New London Ship & Engine Co. The largest new inquiry for fabricated steel calls for 7500 tons, for the New York Athletic Club.

We quote mill shipments, New York delivery, as follows: Soft steel bars, 2.34c. per lb.; plates, 2.24c.; structural shapes, 2.34c.; bar iron, 2.24c.

**Warehouse Business.**—There has been a slight decline in activity, and the demand for structural material from stock is confined to small lots. Buying of sheets continues in good volume, and the current schedule of prices is being adhered to, with no tendency to offer concessions. On bars and shapes, however, there are occasional reports of slight shading. On the whole, prices are well maintained and demand is fair.

**Cast Iron Pipe.**—Most makers are well covered with orders to carry them into the end of the year, but little or no business has appeared as yet for delivery early next year. Prices are firm, but a buyer willing to accept delivery at the convenience of the maker might obtain a concession of \$1 per ton, the usual offer for winter delivery, which, however, was not common last year at this time. About 3000 tons of pipe for the city of Baltimore was awarded by the contractor to the Warren Foundry & Pipe Co. The Department of Water Supply, Gas and Electricity, New York, will open bids Nov. 9, on a contract calling for about 1000 tons of 20-in. water pipe.

We quote pressure pipe per net ton, f.o.b. New York in carload lots, as follows: 6-in. and larger, \$49.60 to \$52.60; 4-in. and 5-in., \$54.60 to \$57.60; 3-in., \$64.60 to \$67.60; with \$5 additional for Class A and gas pipe.

**Old Material.**—Brokers are offering \$15.50 to \$16 per ton, delivered eastern Pennsylvania, for No. 1 heavy melting steel. For steel to be shipped on a recent 20,000-ton purchase, which was distributed among three brokers, \$15.50 per ton is still being offered for delivery on a low freight rate. Yard steel is being bought at \$13.50 per ton, delivered to a Harrisburg consumer, and at \$13.75 to \$14 per ton, delivered to a Pottsville, Pa., user. Most brokers are only offering \$13.50 per ton for specification pipe delivered to a Lebanon, Pa., company, but in a few instances \$14 per ton, delivered, is still being paid. Cast borings are quotable at not more than \$9.25 to \$9.75 per ton, New York, delivered with shipments going forward to Harrisburg at \$13 per ton, delivered, and to Bethlehem at \$12.50 per ton, delivered. Chemical borings are being purchased at \$16 per ton for a Gibbstown user and at \$15.50 per ton, delivered, to a Bound Brook, N. J., consumer.

Buying prices per gross ton, New York, follow:	
Heavy melting steel (yard).....	\$9.50 to \$10.25
Heavy melting steel (railroad or equivalent).....	12.25 to 12.85
Rails for rolling.....	12.50 to 13.00
Steel car axles.....	19.50 to 20.00
Iron car axles.....	24.00 to 24.50
No. 1 railroad wrought.....	14.00 to 15.00
Forge fire.....	9.50 to 10.00
No. 1 yard wrought, long.....	13.00 to 14.00
Cast borings (steel mill).....	9.25 to 9.75
Cast borings (chemical).....	13.00 to 13.50
Machine shop turnings.....	9.25 to 9.75
Mixed borings and turnings.....	9.25 to 9.75
Iron and steel pipe (1 in. diam., not under 2 ft. long).....	9.75 to 10.25
Stove plate (steel mill).....	9.25 to 9.75
Stove plate (foundry).....	11.00 to 11.50
Locomotive grate bars.....	10.50 to 11.00
Malleable cast (railroad).....	16.00 to 16.50
Cast iron carwheels.....	13.00
No. 1 heavy breakable cast.....	12.00 to 14.00

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast.....	\$16.00 to \$16.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	14.50 to 15.00
No. 2 cast (radiators, cast boilers, etc.).....	13.50 to 14.00

**Coke.**—Producers of by-product coke, including the local interest, have advanced prices \$1 per ton, effective Nov. 1. Connellsville prices are difficult to determine, but a fair range of the market today is \$7 to \$7.50 per ton, ovens, on standard foundry and \$5.75 to \$6.25 per ton on furnace grade. These seem to be the quotations at which coke for prompt shipment may be obtained. Many buyers, however, are offering less than these prices, but apparently without much success in securing tonnage. By-product foundry is quoted at \$10.59 to \$11.77, delivered Newark or Jersey City, N. J.

## Cleveland

### Flood of Pig Iron Inquiries—Cleveland Bar Mill Starts Operations

CLEVELAND, Nov. 1.—Market interest is centered in the pig iron situation that has resulted from the advance in coal and coke. Producers are worried over their production costs for the first quarter because of the mounting fuel prices, and that consumers are aroused over the possibility of higher prices is indicated by a flood of pig iron inquiry.

The volume of steel business is light, having changed very little the past week. However, the automotive industry, which recently cut down its steel orders with its curtailment in production, has been somewhat more liberal in its specifications the past week, although it is ordering for only its early requirements based on its reduced production schedules. The policy of placing small orders to fill early needs is also being followed in other industries.

In spite of the decline in business during the latter part of October, orders entered during the month by some of the mills held up to several of the months earlier in the year except September, when there was a great rush of orders on expiring contracts. The Corrigan, McKinney Steel Co., Cleveland, placed its 10-in. merchant bar mill in operation during the week but will not have its 12-in. mill ready to start before February. While steel bars are being freely offered at 2c., Cleveland, Pittsburgh and Youngstown mills show no disposition to meet this price locally, and requests for revision have not come from contract customers. Prices are firm at 1.90c., Pittsburgh, for plates and 2c. for structural material. Plates are dragging, and the demand for structural material has declined, as little new building work is coming out. The Clover Leaf railroad is inquiring for 1000 tons of rails to fill out its 1926 requirements.

**Iron Ore.**—Some of the mining companies operating open pit properties are through with their operations for the season and have shut down their mines. Ore firms are well along with their shipments, and there will be a sharp curtailment in the movement early this month. The Steel Corporation has commenced to lay up its barges. Late season conditions in the ore industry have been generally satisfactory. In very few cases have consumers asked that ore due on contract be carried over to next year, and a few have taken a little more ore than their contracts called for. Late estimates place the season's movement at close to 60,000,000 tons, this including all-rail shipments of 1,500,000 tons.

**Pig Iron.**—A large volume of inquiry for the first quarter has come in the market, owing to the fact that consumers are beginning to realize that they may have to pay higher prices for pig iron because of the fuel situation. Many have sent inquiries by wire and indicate that they want to close without delay. One consumer asked for 5000 tons for the first half. Several producers have withdrawn entirely from the market because of the uncertainty of the fuel situation. Some are not disposed to take business until there is some clearing up as to future fuel prices, and others expect to resume making quotations within a day or two or as soon as they can decide what prices they will ask. One producer, who is temporarily out of the market, has 30 inquiries aggregating 35,000 tons. Considerable business was taken earlier in the week when the situa-

tion was less acute. Among the sales was 3000 tons of malleable iron to an Indianapolis melter. While it is evident that furnaces could book a heavy tonnage of iron for the first quarter at the prices that have prevailed recently, it seems doubtful whether consumers would be willing to pay much of an advance. In the Valley district \$19 furnace is the minimum quotation on foundry and malleable iron. In Cleveland the price is unchanged at \$19.50 for local delivery. Detroit furnaces have marked their price up 50c. to \$20.50.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$3.02 freight rate from Jackson and \$6.01 from Birmingham:

Basic, Valley furnace .....	\$18.00
Northern No. 2 fdy., sil. 1.75 to 2.25 .....	20.00
Southern fdy., sil. 1.75 to 2.25 .....	26.01
Malleable .....	20.00
Ohio silvery, 8 per cent. ....	30.52
Standard low phos., Valley furnace .....	28.00

**Coke.**—Connellsville foundry coke prices have advanced about \$2 a ton during the week, and producers are now asking \$7 to \$7.25, ovens, for standard grades. Foundry heating coke has about disappeared from the market. Some producers are declining to quote prices on by-product coke.

**Iron Ore Shipments.**—Previous shipping records for Lake Superior ore were broken during October when the water movement amounted to 9,337,463 tons. The total movement by water till Nov. 1 was 54,568,371 tons.

**Old Material.**—The downward tendency in prices that has been in evidence for some time appears to have been stopped, at least temporarily. However, there was not enough business during the week to test prices, and strength is lacking in the tone of the market. An additional purchase of a small tonnage of mixed borings and turnings and No. 2 busheling was made by a Cleveland consumer during the week at \$11.75, the price it paid the previous week. Mills generally appear to be comfortably filled with scrap, and shipments of open-hearth scrap are still being held up by a Cleveland and Valley district mill. Additional scrap listings for November that have come from Michigan automobile companies show, with one or two exceptions, sharp reductions in tonnage as compared with their October lists.

We quote per gross ton delivered consumers' yards in Cleveland:

Heavy melting steel .....	\$14.50 to \$14.75
Rolls for rolling .....	16.25 to 16.50
Rolls under 3 ft. ....	16.75 to 17.25
Low phosphorus billet, bloom and slab crops .....	18.50 to 19.00
Low phosphorus sheet bar crops .....	18.00 to 18.50
Low phosphorus plate scrap .....	18.00 to 18.50
Low phosphorus forging crops .....	16.75 to 17.25
Cast iron borings .....	11.25 to 11.50
Machine shop turnings .....	9.25 to 9.50
Mixed borings and short turnings .....	11.25 to 11.50
Compressed sheet steel .....	13.50 to 14.00
No. 1 railroad wrought .....	11.50 to 12.00
No. 2 railroad wrought .....	14.75 to 15.00
Railroad malleable .....	16.75 to 17.25
Light bundled sheet stampings .....	12.00 to 12.50
Steel axle turnings .....	12.50 to 13.00
No. 1 cast .....	16.50 to 17.00
No. 2 busheling .....	11.25 to 11.50
Drop forge flashings, 15 in. and under .....	11.50 to 12.00
Railroad grate bars .....	12.50 to 13.00
Stove plate .....	12.50 to 13.00
Pipes and flues .....	10.00 to 10.50

**Sheets.**—Aside from the falling off in orders from the automotive industry, the demand continues fair, with purchases generally in small lots for early needs. Orders for enameling stock show an improvement. There appears to be little change in the price situation. Some mills are having no difficulty in taking black sheet orders at 3.10c., Pittsburgh, although these

can be bought at 3c. Blue annealed sheets have become fairly well established at 2.30c. and galvanized at 3.85c., although some mills are still trying to get \$2 a ton more.

**Cold-Rolled Strip.**—The curtailment by the automotive industry is more seriously felt by cold-rolled strip mills, as they are getting cleaned up on old orders. Very little new business is coming out. While the common price is 3.25c. on round lots, the market is not firm.

**Bolts, Nuts and Rivets.**—Bolt and nut manufacturers who depend largely on the automotive industry are suffering from a decline in orders, but business is holding up well with other makers. Rivets are moving in satisfactory volume.

## Philadelphia

### Pig Iron Prices Again Advance—Finished Steel Easier

PHILADELPHIA, Nov. 1.—With an increase of \$1, or more, a ton in the price of coke the past week, pig iron also has taken a sharp advance. The foundry and low phosphorus grades are up \$1 and basic, 50c. Sales of both foundry and low phosphorus for last quarter delivery have been made at the higher levels, while light tonnages of basic have been booked at the new price. All furnaces in eastern Pennsylvania which are quoting are naming the advances. Two makers are not quoting. The fuel situation has left producers in a state of uncertainty, and they are not committing themselves beyond the remainder of the year. Under the new prices, foundry iron is quoted at \$22.50, base furnace. Copper-free low phosphorus iron now takes a range of \$24.25 to \$24.75, furnace, while copper-bearing iron is selling at \$25, furnace. Basic has moved in small lots at a spread of \$21.50 to \$22.50, delivered.

Generally, finished lines of steel are easier. However, some mills report that new business is fair. One plate maker booked more tonnage in October than in September. Another steel company with branch offices in this district reported greater business in most all lines in October than any month in its history. The Pennsylvania Railroad today opened bids under the Clayton Act for 2100 tons of splice bars, 625 tons of spikes and 750 tons of joint bars, and a round lot of bolts. It is said that all makers quoted the current prices.

**Pig Iron.**—Demand for export coal on account of the British strike continues to cause prices to mount, and these have been reflected in advances in pig iron quotations. Makers either have gone to the new levels or are not quoting. The lower levels have entirely disappeared. Foundry iron is up \$1 a ton to \$22.50, base furnace, with some business going at this figure. Low phosphorus iron also is up \$1 to \$24.25 to \$24.75, furnace, for copper-free, and \$25, furnace, for copper-bearing tonnage. Basic has increased to \$21.50 to \$22.50, delivered. Unless there is a recession in fuel prices, even higher pig iron levels are being predicted by producers. On the other hand, should the British strike come to an early end, it is believed that fuel prices will take a sharp downward turn and affect the market for pig iron. Two makers of iron are not quoting at all, pending adjustment of schedules and a clearing up of the present state of confusion. The tightening of the market has stimulated demand, and it has become particularly marked for the foundry and low phosphorus grades. Some makers have committed themselves fully for the remainder of the year. There is less tendency than ever to quote for first quarter. Producers are unwilling to contract for coke at prices asked, some of which are as high as \$7, ovens. Connellsville operators seem indifferent as to making any quotation. The higher coke prices are due in part to wage increases both in the Connellsville district of Pennsylvania and the Fairmont district of West Virginia. It is also reported that instead of increasing

### Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and structural shapes .....	3.00c.
Mild steel bars .....	3.00c.
Cold-finished rounds and hexagons .....	3.90c.
Cold-finished flats and squares .....	4.40c.
Hoops and bands .....	3.65c.
No. 24 black sheets .....	3.80c.
No. 10 blue annealed sheets .....	3.25c.
No. 24 galvanized sheets .....	4.65c.
No. 9 annealed wire, per 100 lb. ....	\$3.00
No. 9 galvanized wire, per 100 lb. ....	3.45
Common wire nails, base, per keg .....	3.00



beehive coke oven capacity, it is being curtailed, and coal is being sold direct either in the domestic or foreign market. Recent sales of foundry iron range from 350 to 1500 tons for last quarter delivery. The American Engineering Co., Philadelphia, is inquiring for 1000 tons of No. 2X for first quarter delivery but is understood to have received no quotation. Low phosphorus production is about to be resumed by two operators in this district. One has taken an order for 3000 tons of copper-bearing material at \$25, furnace, for last quarter shipment. The Midvale Co. closed for 1000 tons of copper-bearing iron for last quarter shipment, and is understood to have paid \$25, furnace.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to \$1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	\$22.26 to \$23.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	22.76 to 23.76
East. Pa. No. 1X.	23.26 to 24.26
Virginia No. 2 plain, 1.75 to 2.25 sil.	27.67 to 28.67
Virginia No. 2X, 2.25 to 2.75 sil.	28.17 to 29.17
Basic delivered eastern Pa.	21.50 to 22.50
Gray forge	21.00 to 22.00
Malleable	22.00 to 22.50
Standard low phos. (f.o.b. furnace)	24.25 to 24.75
Copper bearing low phos. (f.o.b. furnace)	25.00

**Ferromanganese.**—Domestic ferromanganese for spot shipment has been advanced to \$100, furnace, but so far as reported no sales have been made at the higher level. Meanwhile the prices of \$88 to \$95 have not entirely disappeared, although the minimum figure is largely nominal. The stiffer tone of the market is partly due to the fuel situation and also to the continued small importations. British ferromanganese still is quoted at \$100, seaboard, but as yet is not a factor in the market in the absence of shipments, and by reason of the lower domestic prices that have been prevailing. Even with higher domestic prices it is not believed ferromanganese from England will enter this market because the coal strike has stopped production. Specifications for ferromanganese are good, but new business is light. Makers are not quoting beyond the last quarter.

**Plates.**—Demand for plates is comparatively light and somewhat easier. One producer, however, reports that bookings for November have started well and are coming from miscellaneous sources. This manufacturer is making delivery in 10 days to two weeks. Requests for early shipment are being made by most buyers, indicating they have no stocks and are using the material as soon as it is received. Prices remain unchanged at 1.90c., Pittsburgh.

**Shapes.**—Demand for structural material is light. There has been a slight falling off, but the price range continues to be 1.90c. to 2c., Pittsburgh. Fabricating work also is in comparatively small volume. The American Bridge Co. was low bidder on one of a number of bridges for the Pennsylvania Railroad, Lines West. The job calls for about 200 tons. The Phoenix

Iron Co. was low bidder on electrification poles for the Pennsylvania Railroad at Wilmington, Del., calling for about 125 tons.

**Bars.**—Only moderate demand is being made for iron and steel bars. Steel bars are quoted at 2c., Pittsburgh. Iron bars are quoted at 1.90c. and 2c., Pittsburgh, depending on the tonnage.

**Sheets.**—No change has developed in the market for sheets, which is quiet. Galvanized is quoted at 3.95c., base Pittsburgh; black at 3.10c., base Pittsburgh, and blue annealed at 2.40c., Pittsburgh. Concessions are still being made.

**Billets.**—The market for billets continues to lag, with makers quoting \$35, Pittsburgh, for rerolling steel and \$40, base Pittsburgh, for forging material.

**Imports.**—Germany continues to lead as a source of pig iron imports at Philadelphia, 1500 tons having come in the last week; 500 tons arrived from France and 100 tons from the Netherlands. Other imports were: Iron ore from Algeria, 6000 tons; chrome ore from Portuguese East Africa, 4300 tons; structural steel from Belgium, 511 tons; iron sheets from Poland, 110 tons, and galvanized steel strip from England, 10 tons.

**Old Material.**—The market is marking time. There have been no transactions of importance. Neither buyers nor sellers seem interested in negotiations. Mills appear to be comfortably booked. Heavy melting steel, scrap rails and cast borings for chemical plants have receded to a range of \$15.50 to \$16.50, and railroad grate bars are down 50c. to \$13.

We quote for delivery, consuming points in this district, as follows:

No. 1 heavy melting steel	\$15.50 to \$16.50
Scrap rails	15.50 to 16.50
Steel rails for rolling	17.00 to 17.50
No. 1 low phos., heavy, 0.04 per cent and under	20.00 to 21.00
Couplers and knuckles	18.50 to 19.00
Rolled steel wheels	18.50 to 19.00
Cast iron carwheels	17.00 to 17.50
No. 1 railroad wrought	17.00 to 17.50
No. 1 forge fire	13.50 to 14.00
Bundled sheets (for steel works)	13.00
Mixed borings and turnings (for blast furnace)	12.50 to 13.00
Machine shop turnings (for steel works)	13.00
Machine shop turnings (for rolling mill)	13.00 to 13.50
Heavy axle turnings (or equivalent)	14.00 to 14.50
Cast borings (for steel works and rolling mill)	13.00 to 13.50
Cast borings (for chemical plant)	15.50 to 16.50
No. 1 cast	17.50 to 18.00
Heavy breakable cast (for steel works)	16.00 to 16.50
Railroad grate bars	13.00
Stove plate (for steel works)	13.00
Wrought iron and soft steel pipes and tubes (new specifications)	14.00 to 14.50
Shafting	21.00 to 22.00
Steel axles	23.00 to 24.00

The American Blower Co., Detroit, manufacturer of air-handling equipment since 1881, announces a new air filter. It is of dry plate design with hair-like tentacles for the arresting and retention of dust and dirt. Dust-laden air is divided into a series of small jets which strike the flat filament coated surface of the plates. The air, changing its direction and rebounding from this surface flows through to the next plate and is carried through ten successive dust removal operations of this type.

The lake freighter Robert Hobson, the second of two boats that are under construction for the Inter-lake Steamship Co., was launched at the Lorain yards of the American Shipbuilding Co., Oct. 30. The boat is named in honor of the late president of the Steel Company of Canada, who died early in the year.

The number of electric hoists ordered in September increased 19.4 per cent as compared with the previous month, and the value of such orders decreased 7.3 per cent, according to the Electric Hoist Manufacturers Association. Shipments were 15.6 per cent larger in September than they were in August.

#### Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Tank steel plates, ¼-in. and heavier	2.80c. to 3.00c.
Tank steel plates, ⅝-in.	3.00c. to 3.20c.
Structural shapes	2.75c. to 3.00c.
Soft steel bars, small shapes and iron bars (except bands)	3.00c. to 3.20c.
Round-edge iron	3.50c.
Round-edge steel, iron finished, 1½ x 1½ in.	3.50c.
Round-edge steel, planished.	4.30c.
Reinforcing steel bars, square, twisted and deformed.	3.00c.
Cold-finished steel, rounds and hexagons	4.00c.
Cold-finished steel, squares and flats	4.50c.
Steel hoops	4.00c. to 4.25c.
Steel bands, No. 12 gage to ⅝-in., inclusive	3.75c. to 3.90c.
Spring steel	5.00c.
No. 24 black sheets	4.35c.
No. 10 blue annealed sheets	3.50c.
No. 24 galvanized sheets	5.30c.
Diamond pattern floor plates—	
¼-in.	5.30c.
⅝-in.	5.50c.
Rails	3.20c.
Tool steel	8.50c.
Swedish iron bars	6.60c.

## San Francisco

### Plates and Shapes Active—British Fuel Demand Affects Local Coke Market

SAN FRANCISCO, Oct. 30 (*By Air Mail*).—For the third successive week activity in plates has been the chief feature in an otherwise quiet market. Plate lettings for the week total 2025 tons, and fresh inquiry calls for 1800 tons. During the past three weeks a total of 11,955 tons of plates has been booked on the Pacific Coast.

During the week 600 tons of German steel and 200 tons of Norwegian ferrosilicon arrived at this port. The steel shipment consists of 300 tons of merchant bars, 200 tons of rails and 100 tons of structural material. A local importer has a shipment of approximately 400 tons of Swedish ferromanganese en route. Local quotations on ferroalloys are made on specific inquiries only.

Because of the demand on the Atlantic seaboard for cargo vessels to carry fuel to the British Isles, local importers are concerned over the increasing difficulty of chartering ships to bring iron, steel and coke from Continental Europe via the Panama Canal to Pacific Coast ports. This has been reflected during the week in stronger quotations on German coke.

**Pig Iron.**—Buying is confined to small lots, and no fresh inquiries of importance have come up for figures. Quotations are unchanged.

	Per Gross Ton
*Utah basic .....	\$25.00 to \$26.00
*Utah foundry, sil. 2.75 to 3.25 .....	25.00 to 26.00
**Indian foundry, sil. 2.75 to 3.25 .....	25.00
**German foundry, sil. 2.75 to 3.25 .....	24.25

\*Delivered San Francisco.  
\*\*Duty paid, f.o.b. cars San Francisco.

**Shapes.**—Fabricated steel lettings for the week total about 1000 tons. Fresh inquiry is confined to jobs calling for small tonnages. There are a number of fair-sized projects pending, however, which are expected to be closed within the next few weeks. The largest individual letting during the week, 255 tons, for a loft building in San Francisco, was taken by the Pacific Rolling Mill Co., Inc. Eastern mills continue to quote plain material at 2.35c., c.i.f. Coast ports.

**Plates.**—The largest individual letting of the week, 1700 tons, for a pipe line and surge tanks for the Washington Water Power Co., Spokane, Wash., was awarded as follows: 1200 tons for a pipe line for the Lake Chelan project, to the Puget Sound Machinery Depot, Seattle, Wash., and 500 tons for surge tanks for the same project, to the Chicago Bridge & Iron Works. The Lemon Grove & Spring Valley Irrigation District, La Mesa, Cal., which originally called for bids on 500 tons for a pipe line, placed 325 tons with the Lacy Mfg. Co., Los Angeles. It also placed a quantity of Matheson joint pipe for the same project. The Shell Oil Co., San Francisco, is taking bids on 1800 tons for tank work to be undertaken at Dominguez, Cal.

**Bars.**—While no awards in concrete bars calling for 100 tons or over have been reported this week, bids have closed on several which are expected to be let during the coming week. Fresh inquiry is relatively small. Price shading continues. Local reinforcing bar jobbers' minimum quotations range from about 2.30c. to 2.45c. base, per lb., on lots of 200 tons.

**Cast Iron Pipe.**—The city of Los Angeles has awarded 390 tons of 2-in. Class B cast iron pipe, as

follows: 285 tons to the American Cast Iron Pipe Co., and 105 tons to the Crane Co. The city of San Diego, Cal., will close bids Nov. 8 on 108 tons of 4 and 6-in. Class B pipe for its Rolando Unit No. 2, and the Ventura County Water District, Ventura, Cal., will read bids Nov. 3 on 142 tons of 4 and 6-in. Class B pipe. On Nov. 4 the city of Shelton, Wash., will take bids on about 300 tons of 4 and 12-in. Class B pipe, and on a quantity of Matheson joint and wooden pipe also.

**Steel Pipe.**—The Pacific Pipe Co., San Francisco, has taken 160 tons of 4 and 6-in. standard pipe for the Bolinas Public Utility District, Bolinas, Cal. The original inquiry called for cast iron pipe.

**Warehouse Business.**—Orders, for the most part, are small and inquiries are confined to routine requirements. Quotations are unchanged.

**Sheets.**—While there is no large buying, small orders are fairly numerous. The total amount called for, however, is light. Eastern mills quote sheets as follows: No. 10 blue annealed sheets, 2.30c. to 2.40c., base Pittsburgh; No. 24 black sheets, 3c. to 3.10c., base, and No. 24 galvanized sheets, 3.85c. to 3.95c., base.

**Coke.**—While buying is fairly brisk, orders are confined to small and moderate tonnages. The British demand for fuel is taking ships from the Pacific Coast, and local importers are concerned about getting shipments of German coke because of the difficulty of chartering vessels at prices which will enable them to bring coke from Germany at a profit. This condition has been reflected during the week in firmer quotations on German by-product fuel, which is now quoted at about \$12 to \$13 per net ton at incoming dock.

## Birmingham

### Pig Iron Buying Lags—Cast Pipe Lettings Light—Steel Output Heavy

BIRMINGHAM, Nov. 1.—With current orders for pig iron rarely covering melters' requirements for more than two weeks ahead, the market is in an uncertain condition. Producers still have fair backlogs, however, and one furnace, which has been on foundry iron, is now producing basic. The melt of foundries in this district is well maintained. Prices are unchanged at \$20, Birmingham, for No. 2 foundry iron, and there are no indications of weakness. Two or three inquiries for first quarter have appeared, but as yet furnaces have made no quotations covering that delivery. Consumption of steel-making iron is heavy, as is indicated by the fact that 11 furnaces are producing basic iron. The Sloss-Sheffield Steel & Iron Co. announces that it is again producing its "Clifton" brand in any silicon desired. Railroad service remains good, and deliveries are going forward without delay to melters in this district.

We quote per gross ton f.o.b. Birmingham district furnaces, as follows:

No. 2 foundry, 1.75 to 2.25 sil.....	\$20.00
No. 1 foundry, 2.25 to 2.75 sil.....	20.50
Basic .....	20.00
Charcoal, warm blast.....	30.00

**Rolled Steel.**—While the market is more or less disturbed because of the cotton situation, business in hand warrants the steady operation of mills, as well as many of the finishing and fabricating shops. The Tennessee Coal, Iron & Railroad Co. has booked a considerable portion of the rails placed by the railroads for 1927 delivery, and at present is rushing deliveries against old contracts. Because of insufficient equipment, the Warrior River barge service declined a shipment of 10,000 tons of rails to Mobile for export to Japan. Fabricating shops are busy. The Ingalls Iron Works will supply the fabricated steel for the Jemmison-Crawford Building in the business section of this city, and has booked 300 tons for a steel shed on the docks at Miami, Fla., destroyed by the recent hurricane. It will also supply 100 tons of corrugated sheets for the latter structure. A new theater in Birmingham will require several hundred tons of steel. Finished steel prices, which are unchanged, are shown on page 1301.

### Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and structural shapes.....	3.30c.
Mild steel bars and small angles.....	3.30c.
Small channels and tees, ¼-in. to 2½-in. .	3.90c.
Spring steel, ¼-in. and thicker.....	5.00c.
No. 24 black sheets .....	4.90c.
No. 28 black sheets .....	5.15c.
No. 10 blue annealed sheets .....	4.00c.
No. 24 galvanized sheets .....	5.65c.
No. 28 galvanized sheets .....	6.15c.
Common wire nails, base per keg.....	\$3.75
Cement coated nails, 100-lb. keg.....	3.75
Cement coated nails, count kegs.....	3.00



**Cast Iron Pipe.**—New business in pressure pipe is light, but tonnage still on the books will permit steady operation of pipe shops throughout the remainder of the year. Prices are unchanged at \$39, base Birmingham, for 6-in. and larger diameters. Several soil pipe shops are also running at capacity, although most plants are operating about four days a week.

**Coke.**—Production is being maintained, and prices are somewhat firmer. On foundry coke, \$5.50, Birmingham, is the maximum, except for small lots on which \$6 is being quoted. All by-product ovens are operating. Considerable coke is moving to points outside of this immediate territory. Independent producers are selling their output steadily, and iron and steel makers with coke-making equipment are using all the coke they produce.

**Old Material.**—Heavy melting steel has advanced, and there have been a few other price adjustments, some up and some down. Deliveries of heavy melting to the larger consumers are heavy.

We quote per gross ton, f.o.b. Birmingham district yards, as follows:

Cast iron borings, chemical.....	\$15.00 to \$16.00
Heavy melting steel.....	13.00 to 14.00
Railroad wrought .....	11.00 to 12.00
Steel axles .....	17.00 to 18.00
Iron axles .....	17.00 to 18.00
Steel rails .....	13.00 to 14.00
No. 1 cast.....	16.00 to 17.00
Tramcar wheels .....	16.50 to 17.50
Carwheels .....	16.00 to 16.50
Stove plate .....	14.00 to 14.50
Machine shop turnings.....	8.00 to 8.50
Cast iron borings.....	8.00 to 8.50
Rails for rolling .....	15.00 to 16.00

Boston

Demand for Pig Iron and Coke Is Active with Prices Strong

BOSTON, Nov. 1.—A decided change has taken place in the complexion of the pig iron market. While formal inquiries have been few, there has been quiet buying in 200 to 500-ton lots that in the aggregate run above 10,000 tons for the past week. It now develops there was considerable quiet buying during the previous two weeks. One of the most active houses estimates that 25,000 tons has been sold in New England in the past three weeks by all furnaces. A Rhode Island machine tool builder is credited with having bought close to 1000 tons of No. 2X and No. 1X iron in the past week; another Rhode Island machinery maker bought 100 tons each of No. 2 plain and No. 2X from a western Pennsylvania, a Buffalo and a New York State furnace; a Connecticut machinery maker bought Buffalo, eastern Pennsylvania and charcoal iron, better than 500 tons in all. Buffalo, east of Buffalo, western Pennsylvania and eastern Pennsylvania furnaces have taken most of the recent business. The volume of bookings was in the order named, and deliveries were about equally divided between November-December and the first quarter. Prices are strong. Those on eastern Pennsylvania irons are 50c. to \$1 a ton higher, and one furnace east of Buffalo, which heretofore has quoted \$20.50 to \$21, base furnace, with no differential on No. 2X, is now \$21 for No. 2 plain, \$21.50 for No. 2X and \$22 for No. 1X. It is officially stated that the Champlain furnace will blow in between Nov. 10 and 15.

We quote delivered prices on the basis of the latest sales as follows, having added \$3.65 freight from eastern Pennsylvania, \$4.91 from Buffalo, \$5.92 from Virginia, and \$6.91 to \$8.77 from Alabama:

East. Penn., sil. 1.75 to 2.25.....	\$25.15 to \$25.65
East. Penn., sil. 2.25 to 2.75.....	25.65 to 26.15
Buffalo, sil. 1.75 to 2.25.....	23.41 to 23.91
Buffalo, sil. 2.25 to 2.75.....	23.91 to 24.41
Virginia, sil. 1.75 to 2.25.....	27.92 to 28.42
Virginia, sil. 2.25 to 2.75.....	28.42 to 28.92
Alabama, sil. 1.75 to 2.25.....	26.91 to 27.41
Alabama, sil. 2.25 to 2.75.....	27.41 to 27.92

**Cast Iron Pipe.**—Providence, R. I., will take bids Nov. 8 on 200 tons of 6-in. pipe, and Lynn, Mass., will close on about the same tonnage of 6 and 8-in. The 1000 tons 24-in. pipe required for the Gloucester, Mass., sewage outfall, bids for which closed some time back, is not yet placed. Pipe makers are maintaining full

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Soft steel bars and small shapes.....	3.265c.
Flats, hot-rolled .....	4.15c.
Reinforcing bars .....	3.265c. to 3.54c.
Iron bars—	
Refined .....	3.265c.
Best refined .....	4.60c.
Norway, rounds .....	6.60c.
Norway, squares and flats .....	7.10c.
Structural shapes—	
Angles and beams .....	3.365c.
Tees .....	3.365c.
Zees .....	3.465c.
Plates .....	3.365c.
Spring steel—	
Open-hearth .....	5.00c. to 10.00c.
Crucible .....	12.00c.
Tire steel .....	4.50c. to 4.75c.
Bands .....	4.015c. to 5.00c.
Hoop steel .....	5.50c. to 6.00c.
Cold-rolled steel—	
Rounds and hexagons .....	4.05c.
Squares and flats .....	4.55c.
Toe calk steel .....	6.00c.

prices on small pipe, but the market for large sizes is decidedly soft. Prices quoted openly on pipe are: 4-in., \$60.10 per net ton, delivered common Boston freight rate points; 6 to 12-in., \$55.10 to \$56.10; larger pipe, \$53.10 to \$55.10. The usual \$5 differential is asked on Class A and gas pipe.

**Coke.**—During the last of October the New England Coal & Coke Co. advanced by-product foundry coke 50c. a ton to \$12.50, delivered within a \$3.10 freight rate zone, and on Nov. 1 advanced it another 50c. At \$13 a ton, this fuel is higher than it has been since the first quarter of 1926. The Providence Gas Co. is also on a \$13, delivered, basis. So great has been the congestion of fuel at Southern water points that New England ovens have been obliged to secure priority orders. After many months during which it sold at a considerable discount from New England fuel, Connellsville foundry coke has jumped to \$7 a ton on cars, ovens, or higher, bringing it in line with delivered prices on New England fuel. New England foundries are specifying heavily against last half contracts for by-product foundry coke, and ovens are beginning to get behind on deliveries.

**Old Material.**—Buying for eastern Pennsylvania delivery has dwindled to small proportions, leaving the old material market even duller than heretofore. Large dealers maintain that they cannot sell at profit at going prices. Consequently what little business is being transacted originates at small yards or at industrial plants. Local dealers report a slightly better feeling in the Pittsburgh district, but that fact, as well as the skyrocketing coal and coke prices, are without influence here. As a matter of fact, prices on specification pipe, chemical and rolling mill borings and cotton ties are easier in the absence of orders.

The following prices are for gross-ton lots delivered consuming points:

Textile cast .....	\$18.50 to \$19.00
No. 1 machinery cast .....	18.50 to 19.00
No. 2 machinery cast .....	16.50 to 17.00
Stove plate .....	14.00 to 14.50
Railroad malleable .....	19.50 to 20.00

The following prices are offered per gross-ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel .....	\$11.00 to \$11.50
No. 1 railroad wrought .....	12.00 to 12.50
No. 1 yard wrought .....	11.00 to 11.50
Wrought pipe (1 in. in diameter, over 2 ft. long).....	9.50 to 10.00
Machine shop turnings .....	8.00 to 8.50
Cast iron borings, chemical.....	10.75 to 11.25
Cast iron borings, rolling mill...	8.00 to 8.50
Blast furnace borings and turnings .....	8.00 to 8.60
Forged scrap .....	8.60 to 9.50
Bundled skeleton, long.....	8.50 to 9.00
Forged flashings .....	9.00 to 9.50
Bundled cotton ties, long.....	8.00 to 8.50
Bundled cotton ties, short.....	8.50 to 9.00
Shafting .....	16.50 to 17.00
Street car axles .....	16.50
Rails for rerolling .....	12.00
Scrap rails .....	11.00 to 11.50

The complaint against the Hayes Wheel Co., Jackson, Mich., has been dismissed by the Federal Trade Commission. The company had been charged with acquiring all of the outstanding common stock of the Imperial Wheel Co. in violation of the Clayton act.

## St. Louis

### Pig Iron Buying Improves—Demand for Sheets Declines

ST. LOUIS, Nov. 1.—A new buying movement in pig iron has developed. The local maker has sold between 8000 and 9000 tons of foundry iron, mostly for the remainder of the year, although some deliveries extend into the first quarter of next year. The principal sale was 3000 tons to a central Illinois melter, and there were other lots of from 500 to 1000 tons. Makers are accepting first quarter business at present prices, and some interest is being shown in iron for that period. The principal inquiry before the market is 5000 tons of foundry iron for delivery to a central Illinois melter. Jobbing foundries in this district report better business. Prices are nominally unchanged.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices, \$2.16 freight from Chicago, \$4.42 from Birmingham, all rail, and 81c. average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25...	\$22.16
Northern malleable, sil. 1.75 to 2.25	22.16
Basic	22.16
Southern fdy., sil. 1.75 to 2.25...	24.42
Granite City iron, sil. 1.75 to 2.25	\$21.81 to 22.21

**Old Material.**—The market is becoming increasingly dull and weak. Consumers in the district are buying nothing, unless it be an exceptional bargain, and dealers' purchases are largely confined to requirements against contracts. There is a marked absence of speculation by dealers. In the meantime railroad lists continue heavy, the week's offerings being: Pennsylvania, 41,000 tons; Missouri Pacific, 7000 tons; Big Four, 3000 tons; St. Louis-San Francisco, 1800 tons; Terminal Railroad Association of St. Louis, 1500 tons; Louisville & Nashville, 1300 tons of relaying rails; Chicago & Alton, 900 tons, and Chicago, Burlington & Quincy, 300 tons of relaying rails.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	\$10.50 to \$11.00
Rails for rolling	15.25 to 15.75
Steel rails less than 3 ft.	16.50 to 17.00
Relaying rails, 60 lb. and under	20.50 to 23.50
Relaying rails, 70 lb. and over	26.50 to 29.00
Cast iron carwheels	15.25 to 15.75
Heavy melting steel	13.00 to 13.50
Heavy shoveling steel	13.00 to 13.50
Frogs, switches and guards cut apart	14.00 to 14.50
Railroad springs	17.25 to 17.75
Heavy axle and tire turnings	10.50 to 11.00
No. 1 locomotive tires	16.00 to 16.50
Per Net Ton	
Steel angle bars	12.50 to 13.00
Steel car axles	18.00 to 18.50
Iron car axles	21.00 to 21.50
Wrought iron bars and transoms	18.50 to 19.00
No. 1 railroad wrought	11.75 to 12.25
No. 2 railroad wrought	11.50 to 12.00
Cast iron borings	9.00 to 9.50
No. 1 busheling	10.00 to 10.50
No. 1 railroad cast	14.50 to 15.00
No. 1 machinery cast	16.50 to 17.00
Railroad malleable	12.25 to 12.50
Machine shop turnings	6.50 to 7.00
Bundled sheets	7.50 to 8.00

**Finished Iron and Steel.**—While new business in sheets is slackening a little, mills are not uneasy, hav-

#### Warehouse Prices, f.o.b. St. Louis

Base per Lb.	
Plates and structural shapes	3.25c.
Bars, mild steel or iron	3.15c.
Cold-finished rounds, shafting and screw stock	3.75c.
No. 24 black sheets	4.45c.
No. 10 blue annealed sheets	3.60c.
No. 24 galvanized sheets	5.25c.
Black corrugated sheets	4.65c.
Galvanized corrugated sheets	5.30c.
Structural rivets	3.65c.
Boiler rivets	3.85c.
Per Cent Off List	
Tank rivets, $\frac{1}{8}$ -in. and smaller	70
Machine bolts	50 and 5
Carriage bolts	47½
Lag screws	55 and 5
Hot-pressed nuts, square, blank or tapped	3.25c. off per lb.
Hot-pressed nuts, hexagons, blank or tapped	3.75c. off per lb.

ing a heavy backlog of orders. A few requests to withhold shipments have come from the South, but so far no cancellations have been received by the local mill. Warehouse business showed a falling off in October, because of heavy rains which retraded operations in the oil fields, and the cotton crisis in the South. Manufacturing users of steel are showing no interest in first quarter requirements. The construction industry is dull.

**Coke.**—The market is very strong, and possibilities of a shortage of coke within the next 30 days are seen. The local by-product ovens are sold up on both foundry and domestic grades. Connellsville beehive foundry coke has advanced to \$6 a ton, ovens, with \$4.54 per ton added for freight to this market.

## Buffalo

### Pig Inquiry Increases—Scrap Output by Automobile Industry Drops

BUFFALO, Nov. 1.—Indications that the rising coal market is impelling pig iron buyers to cover for first quarter and first half are seen in a flood of inquiries, most of them for lots of less than 1000 tons. Furnaces are booking more pig iron in a day than they ordinarily book in three or four days. A down-State melter is in the market for 2000 tons of No. 2 plain and No. 2X for first quarter delivery. A large buyer is inquiring for 600 tons of malleable for delivery at Elmira, N. Y.

We quote prices per gross ton, f.o.b. Buffalo, as follows:

No. 2 plain fdy., sil. 1.75 to 2.25	\$19.00 to \$20.00
No. 2X foundry, sil. 2.25 to 2.75	19.50 to 20.50
No. 1X foundry, sil. 2.75 to 3.25	20.50 to 21.50
Malleable, sil. up to 2.25	20.00
Basic	19.00
Lake Superior charcoal	27.28

**Finished Iron and Steel.**—Demand for bars and shapes is fairly strong, and mill production of those products is around 80 to 85 per cent of capacity. Demand for sheets is active, with No. 24 black firm at 3.10c., base Pittsburgh. Reinforcing bar business is in about the usual volume, and shows little indication of seasonal recession. Mill operations, as a whole, average 85 per cent of capacity.

**Old Material.**—The situation in the soft coal mar-

#### Warehouse Prices, f.o.b. Buffalo

Base per Lb.	
Plates and structural shapes	3.40c.
Mild steel bars	3.30c.
Cold-finished shapes	4.45c.
Rounds	3.95c.
No. 24 black sheets	4.30c.
No. 10 blue annealed sheets	3.80c.
No. 24 galvanized sheets	5.15c.
Common wire nails, base per keg	\$3.90
Black wire, base per 100 lb.	3.90

ket, dealers believe, will have a stimulating effect on the demand for scrap. There has been no sizable buying of scrap during the week, however, since all the mills are well supplied with material. Dealers are busy on old orders. Production of scrap by the automotive industry has been cut 30 to 40 per cent, it is estimated, because of curtailed operations. Prices of material, as quoted below, are firm, and no recession is looked for.

We quote prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	\$15.50 to \$16.00
Selected No. 1 heavy melting steel	17.25 to 17.75
Low phosphorus	18.50 to 19.00
No. 1 railroad wrought	15.00 to 15.50
Carwheels	17.00 to 17.50
Machine shop turnings	10.50 to 10.75
Mixed borings and turnings	12.00 to 12.50
Cast iron borings	12.00 to 12.50
No. 1 busheling	15.00 to 15.50
Stove plate	15.00 to 15.25
Grate bars	13.00 to 13.50
Hand bundled sheets	10.50 to 11.50
Hydraulic compressed	15.00 to 15.50
No. 1 machinery cast	16.00 to 16.25
Railroad malleable	16.50 to 17.00
Iron axles	24.00 to 25.00
Steel axles	16.00 to 16.50
Drop forge flashings	13.75 to 14.25



Cincinnati

Foundry Iron and Silvery Advance—  
Nails Are Weak—Coke Prices Up

CINCINNATI, Nov. 1.—An advance of 50c. a ton in the asking price for southern Ohio foundry iron and of \$1 in the schedule on Jackson County silvery iron have given a firmer tone to the pig iron market. Growing apprehension of producers regarding the cost of coke during the coming winter months has been the most important contributing factor to this upward trend. Lake furnaces also are reported to have stiffened in their attitude, and are getting from 25c. to 50c. a ton more for foundry iron than a week ago. An Indianapolis melter has bought 3000 tons and is understood to have been unsuccessful in obtaining the low prices which prevailed in this territory recently. Iron-ton, Ohio, sellers are quoting \$20.50, base furnace, on small lots for immediate delivery, but will take \$20 for attractive tonnages. The new Jackson County schedule effective today places 8 per cent on a basis of \$28.50, base Jackson. There has been no change in Southern iron, which remains at \$20, base Birmingham. Malleable iron is selling at \$19 to \$19.50, base furnace, for delivery this year, but sellers are reluctant to accept orders for the first quarter at those figures. A Chattanooga, Tenn., melter is inquiring for 300 tons of malleable.

Based on freight rates of \$3.69 from Birmingham and \$1.89 from Iron-ton, we quote f.o.b. Cincinnati:

Alabama fdy., sil. 1.75 to 2.25 (base)	\$23.69
Alabama fdy., sil. 2.25 to 2.75	24.19
Tennessee fdy., sil. 1.75 to 2.25	23.69
Southern Ohio silvery, 8 per cent	29.39
So. Ohio fdy., sil. 1.75 to 2.25	\$21.89 to 22.39
So. Ohio malleable	20.89

**Finished Material.**—While increased specifications and orders gave impetus to the market in the past week, the total bookings for October showed a substantial decline compared with those of September. At least two important producers, however, state that the aggregate tonnage taken in the first 10 months of this year was from 15 to 25 per cent ahead of that for the same period in 1925. Purchases by automobile makers, agricultural implement manufacturers and railroads have slowed down, and jobbers are buying only small lots for quick delivery. In the South the excitement following the announcement of a disastrously large cotton crop has subsided, and consumers there are again specifying at a moderate rate against existing contracts. Fabricators are well engaged on old work, but new projects are less numerous than a few weeks ago. Prices on all commodities except nails are firm. Although sheet makers are holding consistently to 3.95c., base Pittsburgh, on galvanized, 3.10c. on black, and 2.40c. on blue annealed, little new business has been placed at those figures, because most buyers are covered on contracts at the old prices. There has been an active demand for special grades and brands of sheets. Sheet mills in this territory made heavy shipments in October and now are operating at approxi-

mately 85 per cent of capacity. Common wire nails in barge lots are being sold to local jobbers at a delivered price of \$2.75 a keg. An Iron-ton, Ohio, producer recently took an order for a barge load at that figure. In some cases Eastern mills are reported to be meeting that price, but others are adhering to \$2.65c., base Pittsburgh. Plain wire is still quoted at \$2.50 per 100 lb., base Iron-ton or Pittsburgh. Bars and structural shapes are bringing 2c., base Pittsburgh, and tank plates 1.90c., base Pittsburgh.

**Reinforcing Bars.**—For a new plant at Osborne, Ohio, the Southwestern Portland Cement Co. has awarded 150 tons of bars to the Pollak Steel Co. and a like amount to the West Virginia Rail Co. Action on 350 tons for the John Van Range Co., Cincinnati, is expected during the next week. New billet bars are quoted at 2c., base Pittsburgh, and rail steel bars at 1.90c., base mill.

**Warehouse Business.**—While some jobbers report that sales in October were approximately 10 per cent ahead of those in September, others state that the volume of business fell off slightly. Total bookings in the first 10 months of 1926 were about on a par with those in the corresponding period last year. The ability of most mills to supply material promptly has affected the jobbing trade in this territory somewhat adversely. Common wire nails are selling at \$2.85 a keg in Louisville, but locally prices are firm at \$2.95. Quotations on other products are steady and unchanged.

**Coke.**—With dealers unable to obtain an adequate supply of coke, the market has acquired increasing strength in the past week. Because of the sharp advance in the price of coking coal in the last few days, an important seller of by-product coke has withdrawn all outstanding quotations and will set a price on each individual inquiry as it is received. Two by-product companies in this territory have announced an advance of 50c. a ton on domestic grades, No. 2 nut now bringing \$5.50, ovens, and egg and walnut \$6. A southern Indiana producer also has increased by-product domestic coke 25c. a ton to \$7.50, ovens. At Detroit by-product foundry coke is up \$1 for November delivery, the new prices being \$10.50, Detroit ovens, for outside shipment, and \$11.25, delivered in Detroit. Domestic grades, however, will remain at \$8.50, Detroit ovens, for outside shipment, and \$9.25 for delivery in Detroit. Beehive coke in the New River district has gone up 50c. a ton to \$8, ovens. Foundry grades in Wise County are quoted at \$6, ovens, but only small lots are available. It is almost impossible to get furnace coke from that district.

Based on freight rates of \$2.14 from Ashland, Ky., and \$2.59 from Wise County ovens and New River ovens, we quote f.o.b. Cincinnati: Wise County foundry, \$8.59; New River foundry, \$10.59; by-product foundry, \$9.64.

**Old Material.**—Mills are taking contract requirements at a moderate rate, but are not interested in buying for future needs. In foundry grades, consumers are purchasing material only in small lots. Prices have not changed in the past week. The Big Four Railroad has a list totaling about 5000 tons, which closes this week.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and structural shapes	3.40c.
Bars, mild steel or iron	3.30c.
Reinforcing bars	3.30c.
Hoops	4.00c. to 4.25c.
Bands	3.95c.
Cold-finished rounds and hexagons	3.85c.
Squares	4.35c.
Open-hearth spring steel	4.75c. to 5.00c.
No. 24 black sheets	4.05c.
No. 10 blue annealed sheets	3.60c.
No. 24 galvanized sheets	4.90c.
Structural rivets	3.75c.
Small rivets	.65 per cent off list
No. 9 annealed wire, per 100 lb.	\$3.00
Common wire nails, base per keg	2.95
Cement coated nails, base per 100-lb. keg	3.15
Chain, per 100 lb.	7.55
Net per 100 Ft.	
Lap welded steel boiler tubes, 2-in.	\$18.00
4-in.	38.00
Seamless steel boiler tubes, 2-in.	19.00
4-in.	39.00

Per Gross Ton	
Heavy melting steel	\$12.50 to \$13.00
Scrap rails for melting	12.50 to 13.00
Short rails	17.50 to 18.00
Relaying rails	26.50 to 27.00
Rails for rolling	14.00 to 14.50
Old carwheels	12.00 to 12.50
No. 1 locomotive tires	16.50 to 17.00
Railroad malleable	14.50 to 16.00
Agricultural malleable	13.50 to 14.00
Loose sheet clippings	7.00 to 7.50
Champion bundled sheets	8.50 to 9.00
Per Net Ton	
Cast iron borings	6.50 to 7.00
Machine shop turnings	6.00 to 6.50
No. 1 machinery cast	17.00 to 18.00
No. 1 railroad cast	14.00 to 14.50
Iron axles	19.50 to 20.00
No. 1 railroad wrought	9.00 to 9.50
Pipes and flues	7.50 to 8.00
No. 1 busheling	9.00 to 9.50
Mixed busheling	5.50 to 6.00
Burnt cast	6.50 to 7.00
Stove plate	9.00 to 9.50
Brake shoes	9.50 to 10.00

## Canadian Scrap Demand Improves

TORONTO, ONT., Nov. 1.—The Canadian scrap market is gradually taking on new life. While sales are below normal, inquiries are more numerous and in many cases tonnages involved are greater. The bulk of current demand is for spot delivery, although some business has been booked up to the end of the year. Heavy melting steel and machinery cast are the dominating materials in the Ontario market, but of late there has been a better demand for other grades. Trading among dealers is being carried on conservatively, most dealer buying being for direct shipment to consumers. Dealers' buying prices are firm as follows:

	Per Gross Ton	
	Toronto	Montreal
Steel turnings .....	\$8.50	\$8.00
Machine shop turnings....	8.50	7.00
Wrought pipe .....	6.00	6.00
Rails .....	11.00	10.00
No. 1 wrought .....	11.00	14.00
Heavy melting steel .....	11.00	9.00
Steel axles .....	16.00	17.00
Axles, wrought iron .....	18.00	19.00
Boiler plate .....	10.00	8.00
Heavy axle turnings.....	9.00	8.50
Cast borings .....	8.50	7.50
	Per Net Ton	
Standard carwheels .....	15.00	16.00
Malleable scrap .....	14.00	14.00
Stove plate .....	10.00	13.00
No. 1 machinery cast.....	16.00	18.00

## Diminished Supply of Scrap at Detroit

DETROIT, Nov. 1.—Reduced production in the automotive industry is best shown by offerings of waste material for November delivery, which show a decline of 25 to 50 per cent under October releases. The market seems to be marking time with little buying and no declines registered.

The following prices are quoted on a gross ton basis f.o.b. producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting and shoveling steel .....	\$12.50 to \$13.00
Borings and short turnings.....	9.00 to 9.50
Long turnings .....	8.75 to 9.25
No. 1 machinery cast.....	17.00 to 18.00
Automobile cast .....	20.50 to 21.50
Hydraulic compressed .....	12.00 to 12.50
Stove plate .....	13.50 to 14.50
No. 1 busheling.....	11.00 to 11.50
Sheet clippings .....	8.00 to 8.50
Flashings .....	10.75 to 11.25

## RAILROAD EQUIPMENT

### Purchases of Cars Continues Light with Inquiry Slightly More Active

Inquiry for 700 additional tank cars by the Phillips Petroleum Co., and the purchase of 150 coaches by the Philadelphia Rapid Transit Co. and 100 gondola cars by the Norfolk Southern were the only important activities of a quiet week. Items of the week follow:

The Phillips Petroleum Co. is inquiring for 700 tank cars in addition to an inquiry for 200 last week.

The Carnegie Steel Co. is inquiring for 8 hopper cars of 75 tons capacity.

The Norfolk Southern has placed 100 composite gondola cars with the Virginia Bridge & Iron Co.

The Chicago & North Western is inquiring for 8 70-ft. baggage cars.

The Philadelphia Rapid Transit Co. has ordered 150 passenger cars for the Broad Street subway from the J. G. Brill Co.

Installment selling is creating an artificial trade stimulation that cannot give permanency to production, J. H. Tregoe, executive manager of the National Association of Credit Men, 1 Park Avenue, New York, said in a statement issued to the association's membership.

## REINFORCING STEEL

### Week's Inquiries Amount to Nearly 4400 Tons with Awards at 1600 Tons

Awards of concrete reinforcing bars, as reported to THE IRON AGE in the last week, dropped to the lowest aggregate of the year, totalling less than 1600 tons. Included in the 4400 tons up for bids are a highway viaduct in Newark, N. J., which will take 1000 tons, and an automobile service station in New York requiring 900 tons. Awards follow:

HOBOKEN, N. J., 330 tons, factory, Cooper-Hewitt Electric Co., to McClintic-Marshall Co.

OSBORNE, OHIO, 300 tons, plant for Southwestern Portland Cement Co., 150 tons to Pollak Steel Co., and 150 tons to West Virginia Rail Co.

NILES CENTER, ILL., 150 tons, building for division Q of the Sanitary District to Olney J. Dean & Co.

SPRINGFIELD, ILL., 250 tons of rail steel, stadium, to Hugh J. Baker Co.

CHICAGO, 350 tons of rail steel, apartment building on Delaware Place, to Olney J. Dean & Co.

CHICAGO, 100 tons of rail steel, apartment building at 3746 Kenwood Avenue, to the Calumet Steel Co.

STATE OF MINNESOTA, 100 tons, bridge work, to Olney J. Dean & Co.

### Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

BOSTON, 200 tons, Pierce-Arrow Co. salesroom and service station.

LOWELL, MASS., 150 tons, department store.

NORTHAMPTON, MASS., 200 tons, hospital unit.

STAMFORD, CONN., 320 tons, high school; general contract not let.

NEW YORK, 900 tons, Nash service station, 133rd Street and Broadway, Park & Shaffer, architects.

BROOKLYN, 100 tons, warehouse, Brooklyn Storage & Warehouse Co.

NEWARK, N. J., 1000 tons, Lincoln Highway viaduct, erroneously reported among awards last week; bids to be opened Nov. 1.

PATERSON, N. J., 100 tons, stadium; general contract not let.

JAMESTOWN, N. Y., 150 tons, sewage plant; general contract not let.

CHICAGO, 100 tons, Pontiac Engraving Co. building; L. E. Russell, architect.

CHICAGO, tonnage being estimated, Wayne Ridge apartment hotel; Ornstein & Held, architects.

CHICAGO, tonnage being estimated, apartment at 3126 Lincoln Park West; R. DeGolyer, architect.

CHICAGO, 300 tons, Girls Technical High School.

CHICAGO, 200 tons, Municipal Court building; Landquist Construction Co., general contractor.

RICHMOND, CAL., 300 tons, high school; W. S. Wetenhall Co., San Francisco, low bidder.

SAN FRANCISCO, 200 tons, Hearst-Moulder School; Badt-Falk & Co., San Francisco, low bidder.

SAN FRANCISCO, 150 tons, auto sales building on Van Ness Avenue; bids being received.

### Calls Off New Freight Tariffs in Central West

CHICAGO, Nov. 1.—A new schedule of freight tariffs which was to have gone into effect Nov. 1 on pig iron shipments originating in and consigned to points in the Central Freight Association territory has been called off and further conferences will be held before it is made operative.

A civil service examination for chief plant engineer for the quartermaster corps, Fort Mills, Philippine Islands, has been announced by the United States Civil Service Commission. Application blanks should be secured for filing at Washington before Dec. 7.

A course on the psychological foundations of management has been announced by the Bureau of Personnel Administration, 350 Madison Avenue, New York, lectures being held Thursday evenings in the Engineering Societies' Building, New York.



EUROPEAN STEEL ENTENTE

Terms of the Agreement of Continental Producers

THE steel entente signed by the producers of Germany, France, Belgium, Luxemburg and the Saar, is to have an initial duration of five years. Its headquarters will be located at Luxemburg, under the direction of Emile Mayrisch, president of the board of directors of the A.R.B.E.D.

Except for certain trade arrangements among Germany, France, Luxemburg and the Saar for an exchange of their pig iron and steel products, it is claimed that this entente has been made essentially for the control of production and not for an official partition of foreign markets. It is admitted, however, that such a control of output must have its direct effect upon the

Production Quotas of Continental Steel Entente Countries, With Actual Output 1913 and 1925, and Production of the United States and Great Britain for the Same Years

	Production Quotas		Production Steel Ingots, Gross Tons	
	Per Cent	Metric Tons	1925	1913
Total	100.00 <sup>1</sup>	30,560,000 <sup>2</sup>		
Germany	43.17	13,192,752	12,500,000	18,631,000
France	13.19	9,531,664	7,300,000	4,614,000
Belgium	11.56	3,532,736	2,450,000	2,428,000
Luxemburg	8.30	2,536,480	2,050,000	
Saar	5.78	1,766,368	1,575,000	
United States			45,500,000	31,301,000
Great Britain			7,500,000	7,644,000

<sup>1</sup>The countries' percentages given in this column apply to the ultimate maximum quota when this amount will have become operative; for inferior amounts these percentages are slightly modified and are revised each quarter, depending upon the maximum established for such periods and to enable Belgium to obtain a monthly quota of 295,000 metric tons, her percentage of the ultimate maximum quota (30,560,000 metric tons).

<sup>2</sup>This total is the maximum production tonnage planned by the entente to be achieved by a series of increases from the initial quota which for the first quarter, Oct. 1, 1926, to Jan. 1, 1927, is based on an annual total of 27,587,000 metric tons.

supply available for the international market and that international trade will be even more directly affected by an agreement upon prices. Further details of the terms of the entente, given in the following, were obtained from Marshall T. Jones, acting chief of the iron and steel division of the Department of Commerce, based on a report from Trade Commissioner Daniel J. Reagan, at Paris, though the major provisions have

been covered by the European correspondents of THE IRON AGE.

The Brussels agreement established the production level for the first three months of the agreement beginning Oct. 1, on the basis of an annual output for the five members at 27,587,000 metric tons. The quota will be studied each quarter for revision.

The plan first considered called for a quota based on the 1925 total of approximately 26,000,000 tons, which basis was later replaced by the rate of production attained during the first quarter of the current year. Owing to opposition from Belgium, whose quota the producers of that country considered unsatisfactory on the claim that the first three months of 1926 marked a dip in their output, the initial total agreed upon (27,587,000 metric tons) was somewhat higher.

This first quarterly quota is, however, merely a trial amount and the plan, should the market permit it, is to increase it until an ultimate maximum tonnage of 30,560,000 metric tons will have been reached. The definite allotments to each country are based upon this final amount and are as follows:

	Per Cent
For Germany	43.50
For France	31.19
For Belgium	11.56
For Luxemburg	8.55
And the Saar	5.20

The accompanying table shows the distribution of these percentages by countries compared with their total production in 1925 and 1913, as well as the output for the United States and Great Britain in these same years.

Variations in Quotas Below Final Maximum

For the initial quarterly quota, however, (based upon a year's total of 27,587,000 metric tons), these percentages do not strictly apply, because Belgium was able to force through her demand for 295,000 metric tons per month, (approximately 3,540,000 tons per year), instead of 265,000 tons per month offered by the other negotiators.

Minor readjustments in the immediate percentages of the other members have been necessary until the ultimate maximum will have been reached. The Belgian allotment will therefore remain fixed at 295,000 tons a month, whereas the other countries which are forced to accept under the initial quota about 350,000 tons less per year than if they received their full percentages will on the other hand gradually see their percentages raised as the total annual quota approaches the maximum of 30,560,000 tons. Should this latter amount be later increased, Belgium has agreed to accept for any tonnage beyond this amount a percentage which will be greatly inferior to her present allotment.

Industrial Finances

Net profit of Allis-Chalmers Mfg. Co., Milwaukee, for the nine months ended Sept. 30 was estimated at \$2,575,000, as compared with \$2,503,182 reported for the first nine months of 1925. Billings for the nine months are placed at \$22,500,000, while billings for last year's first nine months were reported as \$21,472,274.

The Wheeling Steel Corporation, Wheeling, W. Va., reports a net profit of \$1,295,022 for the quarter ended Sept. 30. In the preceding quarter \$1,208,048 was earned. Net profit for the first nine months of 1926 amounted to \$3,582,684, compared with \$2,720,471 in the corresponding period of 1925.

Net profits of the Inland Steel Co., Chicago, amounted to \$1,701,286 for the third quarter of the year. Profits for the second quarter totaled \$1,792,324, equivalent to \$1.36 on each share of common stock; the profits in the first quarter were \$1,540,909, or \$1.15 per share of common stock.

The Gulf States Steel Co., Birmingham, Ala., earned 90c. per share on common stock during the third quarter of 1926. This failed to cover the \$1.25 dividend on these shares. In the first quarter the company earned \$1.77 on a share; in the second period this dropped to \$1. For the nine months of the year earnings were equivalent to \$3.67 a share, compared to \$5.38 for the first nine months of 1925.

The report of Wickwire Spencer Steel Corporation, New York, for the third quarter showed a net income of \$11,622, compared with a net loss of \$90,911 during the corresponding period of 1925. The net loss for the first nine months

of 1926 totaled \$75,128 as against \$263,344 for the first nine months of last year.

The Replogle Steel Co., Wharton, N. J., reports a net income of \$219,099, equivalent to 44c. a share on 500,000 shares of outstanding capital stock, for the third quarter. This is a loss of 1c. per share when compared with the same period of last year when profits aggregated \$226,562. The net income for the first nine months of 1926 was \$534,050; for the like period of 1925 it was \$452,401.

Orders received by the General Electric Co. for the three months ended Sept. 30, total \$81,587,917, compared with \$73,561,483 for the same quarter in 1925, an increase of 11 per cent, Gerard Swope, president, has announced. For the nine months of the present year, orders total \$246,993,637, compared with \$223,876,711 for the first nine months of 1925, an increase of 10 per cent.

The Donner Steel Co. and subsidiaries reports for the quarter ended Sept. 30, net income of \$205,339 after depreciation and interest, equal after allowing for 8 per cent cumulative first preferred dividends and 7 per cent cumulative preferred to 89c. a share on the 45,225 common shares (\$100 par). Interest charges were earned 2.54 times in the third quarter against 1.86 times in the same period of last year.

The M. A. Hanna Co., Cleveland, reports net profits of \$423,004 for the quarter ending Sept. 30, as compared with \$223,237 in the third quarter last year. Net income for the first nine months of 1926 was \$534,640, as compared with a deficit of \$292,290 for the same period last year.

## NON-FERROUS METAL MARKETS

The Week's Prices		Nov. 1	Oct. 30	Oct. 29	Oct. 28	Oct. 27
	Lake copper, New York....	14.12½	14.12½	14.12½	14.12½	14.25
	Electrolytic copper, N. Y.*..	13.75	13.75	13.75	13.75	13.80
	Straits tin, spot, New York. (67.50)			68.00	69.00	69.50
	Lead, New York.....	8.10	8.25	8.25	8.25	8.25
	Lead, St. Louis.....	7.80	7.95	7.95	7.95	7.95
	Zinc, New York.....	7.60	7.60	7.60	7.57½	7.57½
	Zinc, St. Louis.....	7.25	7.25	7.25	7.22½	7.22½

\*Refinery quotation; delivered price ¼c. higher.

NEW YORK, Nov. 1.—The copper market continues inactive and weaker. With prices falling, sales of tin have been large. Another reduction has been made in lead, with buying only fair. The zinc market is quite firm but inactive.

**Copper.**—The copper market has experienced one of the quietest weeks in a long time. As usual in such cases, there has been enough metal available from some sources to meet the light demand at quotations under the market, and as a result prices have fallen gradually. The 14c. level was reached a few days ago, with reports of slight shading of this possible. No sales have been heard of, however, at less than 14c., delivered, for electrolytic copper. Lake copper is quoted at 14.12½c., delivered. In the export market the official price of Copper Exporters, Inc., remains unchanged at 14.40c., c.i.f.

**Copper Averages.**—The average price of Lake copper for the month of October, based on daily quotations in THE IRON AGE, was 14.26c., delivered. The average price of electrolytic copper was 13.88c., refinery, or 14.13c., delivered.

**Tin.**—The week has been a very active one. Prices have been quite rapidly falling both here and in London, and consumers as well as dealers have been good buyers on the decline. On Friday, Oct. 29, 1000 tons changed hands which, with the 1500 tons previously sold, makes the total for week 2500 tons. The selling has included all positions, even for delivery as far ahead

as February. With the exception of one day there were sellers at the close of the market each day. Estimates of the world's visible supply, made both in New York and London, indicate an increase for October, but not a large one. It is estimated in London that shipments during November and December from the Straits will amount to 13,000 or 14,000 tons, and it is reported that two steamers left there quite recently carrying 600 tons each. These facts are taken to indicate more liberal supplies, and possibly put a damper on speculators. In any event, the tin will be needed. There are indications that consumption of tin is declining in some branches, particularly the automobile industry in its use of babbitt metal. Some point to a possible increase in production and a decrease in consumption, followed by a bear market. The market today was moderately active, with no quotation for spot Straits, but with 67.50c. the price ex-steamer at dock, New York. Prices in London today were decidedly lower than a week ago, with spot standard quoted at £293 10s., future standard at £290 15s. and spot Straits at £301. The Singapore price today was £300 15s.

**Lead.**—Still another reduction has been made by the American Smelting & Refining Co. in its contract price for lead. Today the quotation was lowered \$3 per ton, or from 8.25c. to 8.10c., New York. This reduction is believed to be due in part to a good drop in London with heavy selling there. Up to today the market had held firm at 8c., St. Louis, with 7.95c. available from some sellers. Today the quotation is 7.80c. to 7.85c., St. Louis, or 8.10c., New York.

**Zinc.**—Interest on the part of consumers of prime Western zinc has been at a low ebb, but despite this, prices have remained fairly firm. There has been resistance on the part of sellers to anything less than 7.25c., St. Louis, which has been the firm quotation for several days. The price at New York is 7.60c.

### Metals from New York Warehouse

#### Delivered Prices per Lb.

Tin, Straits pig.....	70.00c. to 70.50c.
Tin, bar .....	71.50 to 72.00
Copper, Lake .....	15.00c.
Copper, electrolytic .....	14.75c.
Copper, casting .....	14.25c.
Zinc, slab .....	8.25c. to 8.75c.
Lead, American pig.....	8.75c. to 9.25c.
Lead, bar .....	11.25c. to 12.25c.
Antimony, Asiatic .....	15.00c. to 16.00c.
Aluminum, No. 1 ingot for remelting (guaranteed over 99 per cent pure) ..	30.00c. to 30.50c.
Babbitt metal, commercial grade ..	30.00c. to 40.00c.
Solder, ½ and ⅓ .....	43.00c. to 44.00c.

### Metals from Cleveland Warehouse

#### Delivered Prices per Lb.

Tin, Straits pig.....	76.50c.
Tin, bar .....	78.50c.
Copper, Lake .....	15.00c.
Copper, electrolytic .....	15.00c.
Copper, casting .....	14.00c.
Zinc, slab .....	8.50c.
Lead, American pig.....	9.00c.
Antimony, Asiatic .....	19.50c.
Lead, bar .....	11.50c.
Babbitt metal, medium grade.....	22.50c.
Babbitt metal, high grade.....	81.50c.
Solder, ½ and ⅓ .....	44.25c.

### Rolled Metals from New York or Cleveland Warehouse

#### Delivered Prices, Base per Lb.

<b>Sheets—</b>	
High brass .....	19.13½c. to 20.12½c.
Copper, hot rolled.....	22.75c. to 23.75c.
Copper, cold rolled, 14 oz. and heavier, ..	25.00c. to 26.00c.
<b>Seamless Tubes—</b>	
Brass .....	24.00c. to 25.00c.
Copper .....	24.75c. to 25.75c.
Brazed Brass Tubes.....	27.12½c. to 28.12½c.
Brass Rods .....	16.87½c. to 17.87½c.

#### From New York Warehouse

#### Delivered Prices, Base per Lb.

Zinc sheets (No. 9), casks.....	13.00c. to 13.25c.
Zinc sheets, open.....	13.50c. to 13.75c.

## Non-Ferrous Rolled Products

Mill prices on bronze, brass and copper products were reduced ¼c. on Oct. 29. Zinc sheets have not changed since July 20. Lead full sheets are quoted at 12c. to 12.25c., having been reduced ¼c. on Oct. 27.

#### On Copper and Brass Products, Freight up to 75c. Per 100 Lb. Allowed on Shipments of 500 Lb. or Over

##### Sheets—

High brass .....	18.87½c.
Copper, hot rolled.....	22.50c.
Zinc .....	11.75c.
Lead (full sheets).....	12.00c. to 12.25c.

##### Seamless Tubes—

High brass .....	23.75c.
Copper .....	24.50c.

##### Rods—

High brass .....	16.62½c.
Naval brass .....	19.37½c.

##### Wire—

Copper .....	15.87½c.
High brass .....	19.37½c.

##### Copper in Rolls.....

21.37½c.
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##### Brazed Brass Tubing.....

26.87½c.
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#### Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of the Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide.....	37.50c.
Tubes, base .....	48.00c.
Machine rods .....	34.00c.



**Rolled Metals, f.o.b. Chicago Warehouse**  
(Prices Cover Trucking to Customers' Doors in City Limits)

Sheets—	Base per Lb.
High brass .....	19½c. to 20½c.
Copper, hot rolled.....	23c.
Copper, cold rolled, 14 oz. and heavier.....	25.25c.
Zinc .....	12.25c.
Lead, wide .....	11.25c.
Seamless Tubes—	
Brass .....	24.25c.
Copper .....	25c.
Brazed Brass Tubes.....	27½c.
Brass Rods .....	17½c.

**Antimony.**—The decline in the price of Chinese metal continues, due to the appearance of larger supplies than were thought available, and today, Monday, the metal is quoted at 13.25c., New York, duty paid for spot delivery, with 13c. quoted for December arrivals.

**Nickel.**—Wholesale lots of ingot nickel are quoted at 35c., with shot nickel at 36c. and electrolytic nickel at 39c. per lb.

**Aluminum.**—Virgin metal, 98 to 99 per cent pure, is quoted at 27c. per lb., delivered.

**Old Metals, Per Pound, New York**

The buying prices represent what large dealers are paying for miscellaneous lots from the smaller accumulators, and the selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible.....	12.00c.	13.50c.
Copper, heavy and wire.....	11.50c.	12.25c.
Copper, light and bottoms....	9.50c.	10.75c.
Brass, heavy .....	7.25c.	8.75c.
Brass, light .....	6.25c.	7.75c.
Heavy machine composition....	9.00c.	10.25c.
No. 1 yellow brass turnings..	8.50c.	9.25c.
No. 1 red brass or composition turnings .....	8.25c.	9.25c.
Lead, heavy .....	6.50c.	7.00c.
Lead, tea .....	5.00c.	5.75c.
Zinc .....	4.25c.	4.75c.
Sheet aluminum .....	17.00c.	19.00c.
Cast aluminum .....	17.00c.	19.00c.

**Non-Ferrous Metals at Chicago**

Nov. 1.—On the whole this market is steady and prices are holding fairly well. Copper is being taken in good volume, but no large orders for extended delivery are reported. The old metal market is quiet and prices are softening. We quote, in carload lots, Lake copper, 14.37½c.; tin, 70.50c.; lead, 8.10c.; zinc, 7.35c.; in less than carload lots, antimony, 15.50c. On old metals we quote copper wire, crucible shapes and copper clips, 10.75c.; copper bottoms, 9.75c.; red brass, 9.25c.; yellow brass, 8c.; lead pipe, 6.75c.; zinc, 5c.; pewter, No. 1, 35c.; tin foil, 43.50c.; block tin, 52c.; aluminum, 17.75c.; all being dealers' prices for less than carload lots.

**Simplified Practice Eliminates Waste**

(Concluded from page 1283)

retaining of men and women in positions for which they are not suited, either through lack of ability or too great ability, was one of the serious administrative problems confronting modern business.

**Attitudes on Stock Ownership**

E. S. Cowdric, member of the Society of Industrial Engineers, in a discussion of "Stock Ownership by American Wage Earners," emphasized the fact that this development in industry is not based upon philanthropy. "Employers," he said, "have realized the desirability of the thrifty employee who has interest in his work and pleasant working conditions."

In minimizing the possible danger of employee stock ownership leading to the control of industry by labor,

he explained that the increase of capital in modern business must necessarily be more rapid than the comparative increase of ownership by workmen. But Mr. Cowdric did not deny that dangers do exist. One of the most important, he pointed out, is the fact that so many companies do not offer a safe security to their employees in their stock. Should the company suffer financial difficulties the employee might be faced with a loss of his entire savings. Another danger might lie in the exertion of sales pressure of the company stock on a workman who is not economically able to make such an investment. There is also the very obvious danger of false economics arising from the sale of stock to employees on various installment plans which might prove disastrous to the company's financial position.

**Changes Drive in Six Days**

(Concluded from page 1285)

poured in 3 hr. It was allowed to set for 9 hr. The time required for assembling and setting the bedplate was 10 hr., and 12 hr. was required for grouting and the setting of the grout.

The lower half of the frame was then assembled on the bedplate, which took 3 hr., and 1 hr. was required to set the armature in the bearings. In this case the armature could be handled by one crane. The assembly of the other half of the frame required 3 hr. To assemble the brush rigging, to complete motor connections, to adjust the brushes and to set them on neutral required a total of 33 hr. The motor was turned over at 10 p. m. on Thursday, Sept. 9. There remained the adjusting of the control, but as the mill, which was being extensively overhauled, was not ready, no further work was done until the next morning. By 10 a. m., Sept. 10, all adjustments were made and the motor was running. The total time required for the completion of the job was 122 hr., which could have been reduced 10 hr. if the mill had been ready to operate. Because of the delay in completion of the mill, the first steel was not rolled until 5 p. m. on Sept. 10. No work was done on the motor, however, after 10 a. m. on that date.

The flywheel motor-generator set and control equipment had been erected prior to the shutdown, and the leads had been run as far as practicable while the engine was in operation. Because of the limited space available in this location, the work had to be carried on under considerable difficulty. There was no space available in the motor room for the storage of parts before the engine was removed, and all material had to be skidded into the motor room from an adjoining mill.

The work involved in electrifying the 24-in. sheet bar mill was not so extensive as in the case of the other two mills, because it was necessary only to remove the engine and couple up the motor and gear, which had been installed previously. This was done in ample time to allow the sheet bar mill to start up with the blooming mill, on which it is dependent for steel. No particular effort was made to push this job, and it was worked on at such times as men were available from the other two mills.

The following is an analysis of the labor required for the whole job:

	Man-Hours
Riggers .....	2,213
Bollermakers .....	1,056
Machinists .....	2,654
Carpenters .....	2,679
Pipe-fitters .....	1,445
Masons .....	36
Electricians .....	2,492
Common labor .....	10,836
Cranemen and locomotive crews.....	1,926
Total .....	25,337

All of the work was done by the regular force of the Inland Steel Co., with the exception of the dynamiting of the old foundations, which was handled by the Chicago Concrete Breaking Co. Before the mills were placed in operation they were in a practically finished condition. Concrete floors had been put in, and except for minor jobs everything was complete.

## FABRICATED STRUCTURAL STEEL

### Awards at 15,500 Tons Total Less Than Half of Last Week's—Inquiries at Fair Rate

Awards of fabricated steel in the past week totaled less than 15,500 tons. New inquiries called for 22,000 tons. Included in the jobs pending is a club building in New York which will take 7500 tons. Awards follow:

NEW YORK, 2600 tons, transmission towers, Phoenix Utilities Co., to Blaw-Knox Co.  
 NEW YORK, 1900 tons, addition to Hotel Manger, Seventh Avenue and Fifty-first Street, to an unnamed fabricator.  
 NEW YORK, 1100 tons, apartment building, East Fifty-seventh Street, to Paterson Bridge Co.  
 NEW YORK, 500 tons, apartment building, Ninety-third Street and West End Avenue, to Paterson Bridge Co.  
 NEW YORK, 800 tons, theater and sanitarium, to an unnamed local fabricator.  
 NEW YORK, 450 tons, bridges and general construction work, New York Central Railroad, distributed among several fabricators.  
 TOMS RIVER, N. J., 200 tons, 200,000-cu. ft. gas holder for Ocean Gas Co., to Stacey Mfg. Co.  
 CHESAPEAKE & OHIO RAILROAD, 250 tons, bridge, to an unnamed fabricator.  
 HAVANA, CUBA, 500 tons, bridge tramways, to Link Belt Co.  
 AMARILLO, TEX., 250 tons, power plant, Austin Brothers, to an unnamed bidder.  
 PENNSYLVANIA RAILROAD, 200 tons, bridges, to American Bridge Co.  
 WILMINGTON, DEL., 125 tons, electrification poles, Pennsylvania Railroad, to Phoenix Iron Co.  
 WAYNESBURG, PA., 125 tons, school, to Pittsburgh-Des Moines Steel Co.  
 PITTSBURGH, 200 tons, Elizabeth Magee Hospital, Forbes and Halket Streets, to Guilbert Steel Co.  
 NEW CASTLE, PA., 1100 tons, National Radiator Co., factory, to Fort Pitt Bridge Works.  
 RIVERDALE, ILL., 450 tons, highway bridge, to American Bridge Co.  
 CHICAGO, BURLINGTON & QUINCY, 175 tons, bridge work, to McClintic-Marshall Co.  
 CASCADE, IOWA, 120 tons, county bridge, to Clinton Bridge Works, Clinton, Iowa.  
 CINCINNATI, 175 tons, building for Royal Blue Bed Springs Co., to William Lang & Sons Co., Cincinnati.  
 BATTLE CREEK, MICH., 170 tons, Washington School, to Lakeside Bridge & Steel Co.  
 CHICAGO, 120 tons, building at 180 West Washington Street, to McClintic-Marshall Co.  
 MADISON, WIS., 482 tons, Memorial Union at University of Wisconsin, to Lakeside Bridge & Steel Co.  
 MILWAUKEE, 265 tons, Bellevue Manor apartments, Erich G. Schroeder Co., to Lakeside Bridge & Steel Co.  
 MILWAUKEE, 130 tons, White Truck Co. service station, to Lakeside Bridge & Steel Co.  
 MILWAUKEE, 100 tons, Holy Angels Academy and high school, to Milwaukee Structural Steel Co.  
 SPOKANE, WASH., 1700 tons, pipe line and surge tanks for the Washington Water Power Co. awarded as follows: 1200 tons Puget Sound Machinery Depot, Seattle, Wash., and 500 tons to Chicago Bridge & Iron Works.  
 LA MESA, CAL., 325 tons, pipe line for the Lemon Grove and Spring Valley Irrigation District, to Lacy Mfg. Co., Los Angeles.  
 OAKLAND, CAL., 190 tons, hospital building for the Baby Hospital of Alameda County, to California Steel Co., San Francisco.  
 CALIFORNIA CITY, CAL., 200 tons, crane runway for Finkbind-Guild Lumber Co., to Pacific Rolling Mill Co.  
 SAN FRANCISCO, 255 tons, loft building at Market and McAllister Streets, to Pacific Rolling Mill Co.  
 SAN FRANCISCO, 125 tons, apartment building at Bush and Jones Streets, to Herrick Iron Works, Oakland.  
 SAN FRANCISCO, 169 tons, apartment building on Larkin Street, to Herrick Iron Works.

#### Structural Projects Pending

Inquiries for fabricated steel work include the following:

PROVIDENCE, R. I., 300 tons, Brown University athletic building.  
 HANOVER, N. H., 280 tons, Dartmouth College library.  
 REVERE, MASS., 118 tons, theater and stores.

NEW YORK, 7500 tons, estimated tonnage for New York Athletic Club; general contract not let.  
 NEW YORK, 1800 tons, apartment building, 775 Park Avenue.  
 BALTIMORE, 1500 tons, municipal building.  
 HAVANA, CUBA, 2500 tons, gas holder; bids in.  
 LOUISVILLE & NASHVILLE RAILROAD, 1500 tons, bridges; bids in Nov. 4.  
 DAYTON, OHIO, 600 tons, assembly building at Wright Flying Field; general contract to E. H. Latham Co., Columbus.  
 SOUTH BEND, IND., 100 tons, dining hall at Notre Dame University.  
 AURORA, ILL., 1200 tons, hotel; general contractor, H. G. Christman.  
 OTTAWA, ILL., 150 tons, addition to the plant of the United States Silica Co.  
 PAINESVILLE, OHIO, 200 tons, Painesville Hotel.  
 LEXINGTON, KY., 400 tons, school.  
 KANKAKEE, ILL., 400 tons, theater and office building.  
 DAVENPORT, IOWA, 100 tons, Campbell Baking Co. addition.  
 LOS ANGELES, 400 tons, Presbyterian Church.  
 SAN FRANCISCO, 1800 tons, nine 45,000-bbl. tanks for the Shell Oil Co. at Dominguez, Cal.; bids being taken.  
 CHELAN FALLS, WASH., 1200 tons, pipe line.

## TINNING CAST IRON\*

### A German Method of Coating Castings—Copper Plated on First

The problem of tinning cast iron is discussed at length by Engineer Marnoch, of Berlin, in *Die Gieserei*, No. 37, 1926. The lack of a good, clean, entirely metallic surface on the part of the castings to be tinned is the chief difficulty met with. This is due to the graphite content of the metal. It therefore becomes necessary to first coat such surfaces with another metal and then apply the molten tin. Deposits of copper, pure iron and other metals may be put on electrolytically, and it is a rather costly proceeding. It has been found cheaper to operate chemically, by immersing the castings, after cleaning with the sand-blast, in an acid copper bath, and then only for a few seconds. A tenacious coating of copper is the result. The operating details are as follows:

The cleaned castings are first immersed in a 15 to 20 per cent mixture of hydrofluoric or hydrochloric acid and water. Such a pickle is most efficacious when at about 80 deg. Fahr. When well etched, the castings are washed and remain under water until ready for immersion in the copper solution. Such a bath is prepared by dissolving five parts by weight of cupric chloride, two and one-half parts ferrous chloride and two-tenths of a part potassium ferrocyanide in water. The amount of water is not given, but presumably the usual 10 per cent solution is to be made, that is, about 75 parts by weight. Additional chemicals are added from time to time in their proper proportion to keep up the strength of the bath.

Immersion in the bath lasts but three seconds, and the copper-coated castings are then heated in a bath of palm oil, raised to a temperature beyond the melting point of tin. From this the castings go into the tin bath, which has a cover of either palm oil, tallow or molten chloride of zinc. The last-named is recommended as obviating strong odors. It is important to get the copper-coated castings promptly into the warming bath, after removal from the copper deposition tank, as oxidation of the coating otherwise takes place at a lively rate. If they are not ready to be warmed up promptly, the coated castings may be kept under water for the time being.

The open tank furnaces containing the molten tin are preferably heated by gas, though other fuels will serve. With solid fuel it is important to have firing and ash removal on opposite sides of the furnace. The range of bath temperature should be from 530 to 580 deg. Fahr. An exhaust fan is used to draw away the fumes; this requires one horsepower. The furnace is a steel frame structure lined with fire brick or tile. The kettle, or tank, is made of steel plate stiffened with angle iron ribs, and is suitably suspended in the furnace. Forced draft firing is recommended, under a pressure of 8 in. of water.

\*Abstracted by Dr. Richard Moldenke, Watchung, N. J.



## PERSONAL

Shirley S. French, vice-president and general manager of the General Fireproofing Co., on Nov. 1 assumed new duties as president of the Berger Mfg. Co., a subsidiary of the Central Alloy Steel Corporation, Canton. He succeeds to the position made vacant by the sudden death of Thomas H. Kane, former vice-president and general manager of the Truscon Steel Co., Youngstown, who collapsed while an operation was being performed on his wife, shortly after his election to the presidency of the Berger company. Mr. French has had experience both in the primary and secondary steel industries, and for 26 years has been connected in official or executive capacities with Youngstown companies. For nine years he was associated with the General Fireproofing Co. He was previously, for two years, general manager of the William Tod Co., at Youngstown, absorbed by the United Engineering & Foundry Co. He was identified at various periods with the Republic Iron & Steel Co. at Toledo, with the United States Steel Corporation at Gary, Ind., during the construction of the Gary plant, and with the Brier Hill Steel Co.



S. S. FRENCH

E. A. McDonald, secretary Standard Tank Car Co., Sharon, Pa., has resigned. He will become associated with the Savage Arms Co., Utica, N. Y., about Nov. 1 or 15, according to information from the New York office.

Gosta Lindstrom, sales director Avesta Iron & Steel Works, Avesta, Sweden, is in the United States. His visit is in the interest of the Avesta works, and he is accompanied by H. L. Stevens, of A. Johnson & Co., New York, American Avesta representatives.

R. E. Hellmund, formerly engineering supervisor Westinghouse Electric & Mfg. Co., has been appointed to the newly created office of chief electrical engineer, and A. M. Dudley, formerly manager automotive equipment engineering department, has been appointed to the position left vacant by Mr. Hellmund. Mr. Hellmund was born in Gotha, Germany, and was graduated from the college of Ilmenau in 1898 with the degree of electrical engineer. He has been with the Westinghouse company since 1907. Mr. Dudley was born in Cincinnati and was graduated from the University of Michigan in 1902. His association with the company began in 1904.

J. M. Rhind has been appointed secretary and treasurer of the Cumberland Steel Co., Cumberland, Md., succeeding the late J. F. Stark. Mr. Rhind has been identified with the company since 1906, and from 1914 until his promotion had been an assistant in the sales department, the direction of which he assumed with his new office.

Durbin Hollingsworth has been named as the new purchasing agent for the Nicholson File Works, Anderson, Ind. He fills the vacancy created by the death of the late William Devitt.

R. M. Bayle has been appointed service manager

in charge of the new service station which the Westinghouse Electric & Mfg. Co. has opened at Fairmont, W. Va. Mr. Bayle is a graduate of Ohio Northern University and has been with the Westinghouse company since 1918.

W. S. Linderman, vice-president Duquesne National Bank, Pittsburgh, has been elected a director of the Pittsburgh Steel Co. He replaces James Speyer, who for a number of years has represented New York banking interests on the board.

J. J. Brady has been placed in charge of the San Francisco territory for the Moltrup Steel Products Co., Beaver Falls, Pa., with office at 650 Howard Street.

James W. Barr, formerly affiliated with the New York office of Manning, Maxwell & Moore, has been made Chicago sales engineer for the New Britain Machine Co., New Britain, Conn.

C. F. Myers has been appointed resident manager of the Buffalo office and yard of Joseph Schonthal Co. He was formerly in the Detroit office. F. I. Kilcline will be associated in the company's Detroit office with C. H. R. MacKenzie, resident manager. He was previously in the Detroit office of David J. Joseph Co.

L. F. Berry has been appointed resident representative of the newly opened branch of Allis-Chalmers Co. in Jackson, Mich., at 512 Reynolds Building. It is a division of the Detroit office. Ernest Smith has been named sales engineer in the Oruro, Bolivia, office of the company. This is a branch of the district office at Santiago, Chile.

George P. Aborn, manager Blake & Knowles Works, East Cambridge, Mass., Worthington Pump & Machinery Corporation, was tendered a dinner Thursday evening, Oct. 28, by his business associates and officials from the New York office of the company at the Engineers Club, Boston, in commemoration of the fortieth anniversary of his connection with the company. Mr. Aborn, earlier in the day was presented a gold watch and chain and an Atwater-Kent radio outfit, the gift of his employees. Mr. Aborn associated himself with the Knowles Steam Pump Works, Warren, Mass., on Oct. 4, 1886, as mechanical engineer. In 1897 the company moved to East Cambridge, consolidating with the George F. Blake Mfg. Co. under the firm name of Blake & Knowles Steam Pump Works. In 1914, the company was taken over by the Worthington Pump & Machinery Corporation. Mr. Aborn has been manager of the East Cambridge plant since 1905.



GEORGE P. ABORN

Nathan H. Sturdy has taken an office in the Prudential Building, Buffalo, where he will practice as a consulting engineer. He was formerly chief and consulting engineer for the Truscon Steel Co., Youngstown, Ohio.

Phillips Isham has been appointed Eastern sales agent for the Pittsburgh Metallurgical Co., Niagara Falls, N. Y., with offices at 30 Church Street, New York.

Evan F. Jones has become president and sole owner of the business of the Park Mfg. Co., Worcester, Mass.,

manufacturer of screw machine products and hardware specialties. Mr. Jones retired four years ago from the Morgan Spring Co., Worcester, of which he had been treasurer and general manager.

Charles W. Reed has resigned as assistant special agent of the Sharon Steel Hoop Co., Sharon, Pa., and as secretary of the Youngstown Safety Council, to become managing secretary of the Richmond, Va., Safety Council. He was identified for three years with the Sharon company and was in charge of welfare work at the time of his resignation.

C. M. Lingle, manager of the Nemacolin mines of the Youngstown Sheet & Tube Co. at Nemacolin, Pa., has recovered from a serious illness.

Frank H. Meyer has been promoted to the position of general manager of the American Welding & Mfg. Co., Warren, Ohio. He was formerly sales manager, to which position Henry R. Lewis has been appointed.

H. R. Heneage, who has been New York district manager of Joseph T. Ryerson & Son, Chicago, for the past 10 years, has resigned to become supervisor of athletics of Dartmouth College. He was graduated from Dartmouth in 1907 and throughout his business career has been actively interested in college athletics. Following a period of employment in steel mills, he entered the Ryerson organization, having about six years in the Chicago offices, after which he came to New York, where shortly afterward he was appointed district manager. Mr. Heneage, who will assume his new duties after Jan. 1, will be succeeded by J. A. McNulty, assistant manager, who has been connected with the New York branch of Joseph T. Ryerson & Son for the past 15 years, prior to which he was with the traffic department of the Lake Shore & Michigan Central and later the Delaware, Lackawanna & Western railroads.

Charles S. Carey, formerly manager of the Cleveland office of the Marquette Ore Co., has accepted a position in the sales department of the Chicago office of Hickman, Williams & Co.

A. H. Vollmer, formerly manager Cleveland office, Domhoff & Joyce Co., and later Chicago manager for that company, has accepted a position in the sales department of Hickman, Williams & Co.

## OBITUARY

JAMES D. ROBERTSON, president and general manager Warren Tool & Forge Co., Warren, Ohio, died of apoplexy on a train while en route from Warren to Pittsburgh Oct. 28. Mr. Robertson was one of the founders in 1911 of the Warren Tool & Forge Co., but it was not until 1923 that he assumed personal direction of its affairs. He is best remembered by his connection with the Pittsburgh Valve Foundry & Construction Co., Pittsburgh, with which he was identified from its organization in 1900 until Jan. 1, 1923. He was appointed sales manager of that company in 1901 and in 1913 was elected vice-president. He was born in Pittsburgh 56 years ago.

JESSE A. VAIL, 70, retired capitalist and former chairman of the board of directors of the Maxwell Motor Co. of Detroit, died Oct. 25, in the Evanston, Ill., hospital. Before becoming an official of the Maxwell company Mr. Vail was a general manager for the Fairbanks-Morse Co. He retired from active business about 10 years ago.

CHARLES G. CHISHOLM, general manager of Haynes Stellite Co., died Thursday, Oct. 21, at the company's

plant in Kokomo, Ind., after a brief illness. He was born in Nova Scotia, May 20, 1886. His early life was spent in California, and his first business connection was with the Southern Pacific Railroad. When general passenger agent of the company in Seattle in 1915, he became affiliated with the Union Carbide Co. at San Francisco. He later was transferred to the New York office, and in 1920 when the Haynes Stellite Co. was acquired by the Union Carbide & Carbon Corporation he became general manager, the position he occupied until his death. His home was in Montclair, N. J.

DR. HAZEN G. TYLER, assistant professor of experimental engineering at New York University and organizer and director of the university's evening engineering division, died Wednesday at the age of 36. He was graduated from Brooklyn Polytechnic Institute in 1911, and in 1916 he was made a doctor of science by New York University. He joined the teaching staff of New York University in 1917.

FRANK A. HALL, sales engineer Dempsey furnace division W. N. Best Corporation, New York, was killed in an automobile accident Oct. 19. Previously he was affiliated with the Bristol Co., F. J. Ryan & Co., and the Republic Flow Meters Co. He was a graduate of the University of Pennsylvania and was 33 years old.

MYRON I. ARMS, chairman of the board of directors of the General Fireproofing Co., Youngstown, chairman of the Ohio Leather Co., Girard, Ohio, and identified all of his life with Mahoning Valley industries, died Oct. 29, following a three weeks' illness at the age of 72 years. He organized and became president of the Falcon Iron & Nail Co., one of the first tin plate companies in this country, which subsequently became a part of the American Sheet & Tin Plate Co. He was the organizer of the General Fireproofing Co. and served as its first president. The company was originally a merger of the International Metal Lath Co., Brooklyn, and the Federal Bronze Co., Youngstown. Mr. Arms was active in the charitable and philanthropic movements of his community.

CHARLES ELLIOTT, general superintendent of the Mount Vernon Car Mfg. Co., died at his home in Mount Vernon, Ill., Oct. 26. He was born in Scotland 58 years ago. He had had experience in the ship yards in Scotland before coming to this country when 20 years of age. He first was employed in large steel mills in the Pittsburgh district and about 20 years ago he entered the car building business. He worked in the East and later in Chicago. He became general superintendent of the Mt. Vernon Car Co. in 1916.

GEORGE A. DRYSDALE, metallurgical engineer of the Pittsburgh Plate Glass Co., Columbia Chemical Division, Barberton, Ohio, died Nov. 1 at his home in Cleveland after several weeks' illness.

Turbo-compressors and blowers and power rectifiers manufactured by the American Brown Boveri Electric Corporation, Camden, N. J., are the subjects of two booklets published by that company, which a short time ago took over the plant of the New York Shipbuilding Corporation at Camden, N. J., for the manufacture of electrical machinery and allied products. The booklet on turbo-compressors and blowers devotes considerable space to turbo blowers for steel plants and blast furnaces.

The plant of the Consolidated Expanded Metal Co., a subsidiary of the Wheeling Steel Corporation, is to be moved from Rankin, Pa., to Beech Bottom, W. Va., where the parent organization has extensive land holdings and a plant producing the kinds of steel used by the Metal company. The change will obviate the necessity of shipping the raw material from Wheeling to Pittsburgh and consequently effect a saving in freight charges. General offices of the Metal company will be in the old Wheeling Steel & Iron Co. building, Main and South Streets, Wheeling.



# British Fuel Shortage Becoming Acute

Some Mills Forced to Close as Coal Is Diverted to Public Service and Domestic Use—German Mills at 80 Per Cent

(By Cable)

LONDON, ENGLAND, Nov. 1.

THE coal situation is growing worse with all kinds of industrial fuel scarce, public services and householders receiving preferential treatment and shipments. Continental deliveries of fuel are further delayed and coal is arriving from South Africa, India and Australia.

Little revival in the Cleveland iron trade seems possible before the end of the year. Only five furnaces are in blast throughout the United Kingdom and no foundry iron is obtainable for delivery before the middle of the current month. Hematite is scarce, with only the low grade available. Foreign ore continues quiet, and Bilbao Rubio quotations are nominal.

The Government is embargoing coal for steel works, so they are in need of raw materials and are not selling for forward delivery except at higher prices, plates for early rolling quoted up to £10 10s., f.o.b. works.

The Clyde output in October was 11 vessels of 12,000 tons.

Continental markets are irregular, but there is good demand from British users for semi-finished, with supplies scarce and makers behind on shipments. The Halbergerhutte in the Saar is building its sixth blast furnace. The central German steel combination is expected to become operative about the end of November.

Tin plate is strong as a result of increasing costs and the reluctance of makers to accept forward business because of irregular coal deliveries.

The Briton Ferry Steel Co., Ltd., and the Bynea Steel Works, Ltd., have closed their rolling mills as a result of the fuel embargo, but Lydney is resuming operation of eight tin plate mills. Galvanized sheets are firm but quiet, with makers sold out to the end of the year and not quoting for next year's delivery. Black sheets are dull and demand is small.

## German Production at 80 Per Cent and Export Bounties Lowered

(By Radio)

BERLIN, GERMANY, Nov. 1.

The market is more active, and both pig iron and steel production is increasing, but the pig iron and steel syndicate's domestic prices continue unchanged for November. The steel syndicate has raised its November production quota to 80 per cent of capacity. Export of pig iron is increasing, the scrap market is more active and exports of machinery and wire are much improved.

As a result of the rising world-market prices the steel syndicate's bounties to exporting manufacturers have been reduced. The November bounties on ingots are 15m. per ton lower than August, on blooms 17m. per ton lower and on bars 23m. per ton lower. Bounties on other products have been reduced proportionately.

## Despite Heavy Demand Belgian Mills Reduce Output to New Quota

ANTWERP, BELGIUM, Oct. 16.—The market is steady and prices are showing greater strength than a fortnight ago, although no definite advances in quotations have been made. Demand is improving as buyers become accustomed to the new level of the market and the firm attitude of mills, which are well provided with tonnage. Some of the large mills are out of the market for the present while others are quoting high prices. Where prompt delivery is specified it is sometimes difficult to place an order.

One unsatisfactory feature of the present activity is the realization by Belgian mills that under the terms of the new International Steel Cartel, production must be curtailed in the face of heavy buying while Luxembourg mills, based on last month's output may not be able to dispose of their allotted production. Competition between the steel producing countries of Europe

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.86 per £ as follows:

Durham coke, f.o.b.	£3 0s.	\$14.58
Bilbao Rubio cmet.	1 0	4.86
Cleveland No. 1 fdy.		
(nom.)	6 5	30.38
Cleveland No. 3 fdy.	6 0	29.16
Cleveland No. 4 fdy.	5 19	28.92
Cleveland No. 4 forge	5 18½	28.80
Cleveland basic (nom.)	3 15	to £3 15½s. 18.23 to \$18.35
East Coast mixed	4 8½	21.50
East Coast hematite	4 8	21.38
Rails, 60 lb. and up	7 15	to 8 0 37.66 to 38.88
Billets	7 10	to 8 15 36.45 to 40.10
Ferromanganese	15 0	72.90
*Ferromanganese	14 0	68.04
Sheet and tin plate bars, Welsh	6 15	to 7 10 32.81 to 36.45
Tin plates, base box	1 4	to 1 6 5.83 to 7.29
Black sheets, Japanese specifications	15 5	to 15 15 74.12 to 76.55
Ship plates	7 15	to 8 5 1.68 to 1.79
Boiler plates	10 11	2.28
Tees	8 5	to 8 15 1.79 to 1.89
Channels	7 10	to 8 0 1.62 to 1.73
Beams	7 5	to 7 15 1.57 to 1.68
Round bars, ¾ to 3 in.	8 5	to 8 15 1.79 to 1.89
Steel hoops	10 10	and 11 0* 2.28 and 2.39*
Black sheets, 24 gage	12 0	to 12 5 2.59 to 2.65
Galv. sheets, 24 gage	17 0	to 17 10 3.68 to 3.79
Cold rolled steel strip, 20 gage, nom.	18 0	3.91

\*Export price.

†Ex-ship, Tees, nominal.

## Continental Prices, All F.O.B. Channel Ports (Per Metric Ton)

Foundry pig iron: (a)				
Belgium	£3 17s.	to £4 0s.	\$18.71	to \$19.44
France	3 17	to 4 0	18.71	to 19.44
Luxemburg	3 17	to 4 0	18.71	to 19.44
Basic pig iron:				
Belgium	3 10	to 3 12	17.01	to 17.50
France	3 10	to 3 12	17.01	to 17.50
Luxemburg	3 10	to 3 12	17.01	to 17.50
Coke	0 18		4.37	
Billets:				
Belgium	5 4	to 5 8	25.27	to 26.24
France	5 4	to 5 8	25.27	to 26.24
Merchant bars:				
Belgium	5 15	to 5 17½	1.26	to 1.27
Luxemburg	5 15	to 5 17½	1.26	to 1.27
France	5 15	to 5 17½	1.26	to 1.27
Joints (beams):				
Belgium	5 14	to 6 0	1.25	to 1.32
Luxemburg	5 14	to 6 0	1.25	to 1.32
France	5 14	to 6 0	1.25	to 1.32
Angles:				
Belgium	6 0		1.32	
½-in. plates:				
Belgium (nominal)	6 17½	to 7 0	1.51	to 1.54
Germany (nominal)	6 17½	to 7 0	1.51	to 1.54
¾-in. ship plates:				
Belgium	6 7½		1.40	
Luxemburg	6 7½		1.40	
Sheets, heavy:				
Belgium	6 3	to 6 4	1.33	to 1.34
Germany	6 3	to 6 4	1.33	to 1.34

(a) Nominal.

seems to be rapidly disappearing. French and Luxemburg makers are quoting on the same level as Belgian and only occasionally is a slight concession obtainable on export business from one of the large German sellers.

**Pig Iron.**—Demand for phosphoric foundry iron has declined in the domestic market but export purchasing especially by British consumers is maintaining the export price, and a recent advance brought it to £3 15s. to £3 17s. per metric ton (\$18.85) f.o.b. Antwerp. In the domestic market foundry is on a basis of 625 to 635 fr. and fairly firm at this level as the available tonnage for October is extremely small. No medium phosphorus foundry is being produced. Hematite iron is scarce with none available for prompt shipment as a result of high prices paid recently by British users. As a result, Belgian consumers are turning temporarily to German hematite which is cheaper than French. A further increase in the price of coke of about 10 to 15 fr. per ton is expected for next month. The price for October is 230 fr. with 235 to 240 fr. per metric ton being paid in the open market.

**Semi-Finished Material.**—Further advances in this market have brought prices to a new high level of £5 6s. (\$26) per ton for billets, £5 2s. 6d. (\$25.10) for blooms and £5 10s. (\$26.95) per ton for sheet bars. Although production of semi-finished is larger, especially in blooms, the quantities available are small as a result of the heavy demand for export and an active domestic market in which franc prices are equivalent to the pound sterling export quotation.

**Finished Material.**—The situation has definitely developed into a seller's market and most mills are obtaining their originally quoted prices without difficulty. On a few products, particularly bars, there are occasionally lower prices quoted by German makers for export but such instances are decreasing. Luxemburg and French mills are on the same level as Belgian sellers. As high as £5 15s. (\$28.20) per ton is generally admitted as the level for bars and a few orders have been placed at this price. Angles are active with the price the same. Beams are firm at £5 12s. and corrugated bars are quoted at £6 5s. (\$30.65) per ton.

### Employment Declines in Metal-Working Shops

The number of employees in more than 860 plants affiliated with the National Metal Trades Association declined in September to 634,780. The August total was 636,031. The shops reporting are located in New England, New York, New Jersey, Pennsylvania, Ohio, Indiana, Michigan, Wisconsin, Illinois, Iowa and Missouri. The entire decline was in shops located in States west of Pennsylvania. Detroit alone showed a loss of over 5000 employees. The September total for that city was 234,000, as against 239,099 in August.

### Puddling Wage Rates Remain Unchanged

Tonnage rates paid boilers and finishers in mid-western mills continue unchanged for November-December, following the bi-monthly settlement last week at Pittsburgh. Average selling price of bar iron shipped by subscribing mills was disclosed as 2c per lb., the same as the average two months previously. Puddlers are paid \$11.38 per ton, while finishers receive a rate about 30 per cent above base. S. C. Leonard, Detroit, Mich., secretary of the Western Bar Iron Association, acted for employers, and M. F. Tighe, Pittsburgh, president of the Amalgamated Association of Iron, Steel & Tin Workers, for the employees.

Civil service examinations for metallurgist for the Bureau of Mines at Washington have been announced by the United States Civil Service Commission, Washington, to which application should be made for proper blanks not later than Dec. 7. There is also a vacancy in the position of assistant metallurgist at the Frankford Arsenal, Philadelphia.

## RUSSIAN OUTPUT INCREASED

### Advance of 34 Per Cent in Production of Iron and Steel Planned but a Lack of Coke

MOSCOW, RUSSIA, Oct. 10.—The metal production decided upon by the Glavmetal Board, for the recently begun business year, 1926-27, calls for an output of 2,977,000 metric tons of pig iron, 3,464,000 tons of steel and 2,566,000 tons of rolling-mill products. This scheduled output of pig iron is about 34 per cent more than in the past fiscal year, 1925-26, of steel about 18 per cent more and of rolling-mill products, about 16 per cent more. These increases in the production of iron and steel are considerably higher than the estimated advance in output for all other state-owned industries, which is about 15.8 per cent, but the metal industries are far behind the pre-war years. While the production figures for 1925-26 are not yet corrected, the following comparison shows the advances made in iron and steel output in metric tons in the past three years:

Year	Pig Iron	Steel	Rolled Products
1923-24 .....	661,000	993,000	690,000
1924-25 .....	1,304,000	1,864,000	1,334,000
1925-26 .....	2,220,000	2,918,000	2,232,000
1926-27 (scheduled)	2,977,000	3,464,000	2,566,000

Even the output planned for the coming year is well below the pre-war production figures, which show that in 1913 there were 4,206,000 tons of pig iron, 4,277,000 tons of steel and 3,509,000 tons of rolling-mill products. Supply last year, however, was far short of demand and in the coming year it is estimated that there will be a deficit of about 30 per cent after the railroads have received all their requirements, state industries 70 to 80 per cent of requirements and small industries and the general consumer about 40 to 50 per cent of their needs. Completion of the program for the coming year is considered doubtful as the previous year's output was curtailed by the insufficient supply of coke.

### Recession in Steel Operations at Youngstown

YOUNGSTOWN, Nov. 2.—Operations of iron and steel companies in the Youngstown district register a further decline. Of 53 independent open-hearth furnaces, 34 are active, a decline of one from the preceding week, while 108 of 127 sheet mills are scheduled. However, the sheet mills will not operate throughout the week in some cases, such capacity being active at an average rate of 75 per cent.

With the independents, merchant steel bar activities have fallen to 65 per cent. Strip mill operations have been curtailed, due to a decline in strip buying from the automobile industry.

### Rates on Cotton Ties Upheld

WASHINGTON, Nov. 1.—Passing upon a complaint of the Carolina Bagging Co., Henderson, N. C., Examiner S. A. Aplin has recommended that the Interstate Commerce Commission find that the rates of 72c. per 100 lb. to Galveston and Houston, Tex., and 80c. to Texas common points on cotton ties from Henderson are not unreasonable.

Heating and ventilating apparatus will form a section of the fifth national Exposition of Power and Mechanical Engineering to be held at the Grand Central Palace from Dec. 6 through Dec. 11. The president of the American Society of Heating and Ventilating Engineers, W. H. Driscoll, and a past president, Homer Addams, are members of the advisory board for the power show.



# Exports Increase; Imports Drop

Shipments of Iron and Steel Greater Than for August  
This Year or September, 1925—Exports for  
First Nine Months Also Show Gain

WASHINGTON, Oct. 26.—Making a gain of 10,483 gross tons, exports of iron and steel in September totaled 182,071 tons, as against 171,588 tons in August. Imports took the opposite turn, declining 6094 tons to a total of 85,484 tons in September from 91,578 tons in August. The chief increases in exports in September were made in tin plate and welded pipe. There were a number of decreases, such as in semi-finished products, galvanized sheets, plain structural material and plates. The principal decreases in imports were in pig iron, ferroalloys, and scrap. Increases were made in such lines as semi-finished steel, structural shapes and tubular products.

Exports for September also showed a gain over the total of 136,754 tons for September of last year, and for the nine months ended with September of the current year the aggregate was 1,576,969 tons, compared with 1,306,674 for the corresponding period of 1925. Imports also showed gains for September and the nine months of 1926 compared with corresponding periods of last year. For September, 1925, the total was 68,445 tons, or 17,039 tons less than in that month this year, while for the nine months ended with September, 1926, the total was 872,442 tons, as against 695,236 tons for the same months of last year.

An interesting phase of the import movement in September, 1926, was that Germany again was the leading source of shipments, supplying 29,378 tons, as against 21,309 tons coming from Belgium, which

ranked second. Germany also led for the nine months, furnishing 206,349 tons, as against 167,268 tons coming from Belgium, which also ranked second for that period.

Canada, as usual, was the leading destination for American iron and steel exports in September, taking 68,785 tons, or 37.7 per cent of the total. For the nine months ended with September, Canada took 630,648 tons, as against 432,371 tons for the corresponding period of last year. Japan ranked second in September, taking 13,828 tons, while for the nine months Cuba was second with a total of 116,293 tons.

Tin plate led other commodities in tonnage exported in September, outgoing shipments amounting to 26,608 tons. Of this total, Canada took 8139 tons; China, 2175 tons; Japan, 2120 tons, and Mexico, 1722 tons. Exports of boiler tubes and welded pipe in September totaled 23,717 tons, of which 8875 tons was black pipe

## Sources of American Imports of Iron Ore

	(In Gross Tons)		Nine Months Ended September	
	September		1926	
	1926	1925	1926	1925
Chile .....	111,000	30,300	1,040,200	693,500
Cuba .....	46,000	23,500	428,500	377,130
Spain .....	.....	.....	82,412	130,125
Sweden .....	7,445	14,458	30,250	100,165
French Africa .....	44,871	22,750	273,062	147,495
Canada .....	1,069	565	15,817	5,688
Other countries .....	21,975	1,120	104,101	45,825
Total .....	232,360	92,693	1,974,342	1,499,928

## Imports of Iron and Steel into the United States

	(In Gross Tons)		Nine Months Ended September	
	September		1926	
	1926	1925	1926	1925
Pig iron .....	17,508	29,917	394,412	315,671
Ferromanganese .....	1,707	3,294	28,841	50,985
Ferrosilicon .....	818	300	8,280	3,937
Scrap .....	10,910	10,413	59,481	71,430
Pig iron, ferroalloys and scrap .....	30,943	43,924	491,014	442,023
Steel ingots, blooms, billets and slabs ..	4,381	1,855	26,652	21,230
Iron blooms, slabs, etc. ....	.....	.....	323	16
Wire rods .....	511	324	6,727	5,485
Semi-finished steel ..	4,892	2,179	33,708	26,731
Rails and splice bars ..	11,401	4,453	54,320	36,393
Structural shapes .....	13,351	6,086	84,405	61,284
Boiler and other plates ..	29	52	3,622	410
Sheets and saw plates ..	1,380	197	6,629	2,785
Steel bars .....	8,581	3,748	81,198	43,126
Bar iron .....	125	353	4,078	9,070
Hoops, bands and cotton ties ..	2,777	.....	18,442	8,869
Tubular products (wrought) ..	1,571	6,260	18,606	14,500
Nails, tacks, staples ..	391	26	3,613	1,121
Tin plate .....	21	24	2,036	200
Bolts, nuts, rivets and washers .....	11	6	305	79
Round iron and steel wire .....	276	390	2,930	3,023
Barbed wire .....	285	.....	2,616	4,185
Flat wire; strip steel ..	162	170	3,208	1,610
Steel telegraph and telephone wire ..	.....	.....	121	401
Wire rope and strand ..	288	112	2,156	1,243
Other wire .....	101	.....	1,430	305
Wire cloth and screening ..	5	.....	251	227
Rolled and finished steel .....	40,755	21,877	289,966	188,831
Cast iron pipe .....	8,724	.....	55,848	35,116
Castings and forgings ..	170	465	1,912	2,452
Other iron and steel ..	.....	.....	.....	86
Total .....	85,484	68,445	872,442	695,239
Manganese ore* .....	18,167	22,709	293,836	172,488
Iron ore .....	232,360	92,693	1,974,342	1,499,928
Magnesite .....	4,452	4,074	62,393	73,265

\*Imports of manganese ore from Cuba, which are duty free and not included in the table, aggregated 4,814 gross tons in September.

## Sources of Imports of Pig Iron by Countries

	(In Gross Tons)		Nine Months Ended	
	September		Sept., 1926	
	1926	1925	1926	1926
United Kingdom .....	.....	10,402	3,244	92,039
British India .....	3,742	10,319	4,067	78,992
Germany .....	10,415	5,351	13,200	123,835
Netherlands .....	2,484	3,450	5,340	57,300
Canada .....	465	170	78	3,791
Belgium .....	40	100	.....	6,138
France .....	362	.....	.....	26,833
Other countries .....	.....	125	609	5,484
Total ....	17,508	29,917	26,538	394,412

## Imports of Iron and Steel Products into the United States by Countries of Origin

	(In Gross Tons)		
From	September, 1926	January Through September	
Austria .....	38	576	
Belgium .....	21,309	167,268	
Czechoslovakia .....	591	1,310	
Denmark .....	...	2,409	
Finland .....	...	799	
France .....	9,733	103,550	
Germany .....	29,378	206,349	
Italy .....	106	669	
Lithuania .....	...	1,530	
Netherlands .....	4,094	75,155	
Norway .....	38	11,326	
Poland and Danzig .....	...	816	
Sweden .....	2,377	21,843	
United Kingdom .....	1,831	114,969	
Other Europe .....	...	24	
<i>Europe</i> .....	<i>69,495</i>	<i>708,593</i>	
Canada .....	10,854	62,368	
Panama .....	...	7,748	
Mexico .....	38	8,061	
Cuba .....	1,349	5,757	
Other America .....	...	475	
<i>America</i> .....	<i>12,241</i>	<i>84,409</i>	
India .....	3,742	79,402	
Other Asia .....	6	31	
Algeria and Tunis .....	...	7	
Total .....	<u>85,484</u>	<u>872,442</u>	

and 3175 tons, galvanized pipe. Most of the black pipe was distributed as follows: Colombia, 1950 tons; Kwantung 1837 tons; United Kingdom, 984 tons; Mexico, 660 tons; Chile, 439 tons, and Cuba, 377 tons. The countries taking the bulk of the widely scattered exports of galvanized pipe were as follows: Brazil, 495 tons; United Kingdom, 346 tons; Cuba, 297 tons; Mexico, 248 tons, and Belgium, 301 tons.

Pig iron imports in September declined to 17,508 tons, as against 26,538 tons in August. Evidently because of the coal strike, there were no imports of pig iron from Great Britain in September. Germany was the leading source of this product, supplying 10,415 tons, and that country also ranked first for the nine months, furnishing 123,835 tons of the total of 394,412 tons. British India was second for both the single month and the nine months, supplying 3742 tons and 78,992 tons respectively.

Imports of iron ore in September aggregated 232,360 tons, of which 110,000 tons came from Chile. Of the 1707 tons of ferromanganese imported in September, 1670 tons came from Canada, with none from England. Manganese ore concentrates imported in September totaled 18,167 tons, of which 11,488 tons came from Brazil, 5592 tons from British West Africa and 1040 tons from British India. Cuban shipments of manganese ore, imported by gross tonnage because there is no duty, totaled 4814 tons. Of the 10,910 tons of scrap imported in September, 7354 tons came from Canada and 1349 tons from Cuba.

Imports of steel bars, amounting to 8581 tons, came chiefly from Belgium, 3534 tons; Germany supplied 2570 tons and France, 1322 tons. Of the 2777 tons of hoops, bands and cotton ties imported in September, Germany provided 1198 tons and the United Kingdom, 1000 tons. Belgium supplied 10,539 tons of the 13,351 tons of structural shapes imported in September, and Germany furnished 1978 tons. Of rail imports amounting to 9830 tons in September, 8171 tons came from Germany and 1644 tons from Belgium. France fur-

nished 5049 tons of the 8724 tons of cast iron pipe imported during that month, while Belgium supplied 3073 tons.

## PURE SCIENTIFIC RESEARCH

### Hampered in Europe by Lack of Money— Effect on American Progress

That scientific research in Europe, so long the basis for formulas on which many of our great American industries are founded, has received a great setback is the opinion expressed by Dr. Vernon Kellogg, secretary National Research Council, who has just returned to Washington after several months abroad. "Everywhere," said Doctor Kellogg, "I was met with the cry: 'We have little money for research; what are you in America going to do?' In the past the great research institutes and universities of Europe have supplied the world with a wealth of scientific knowledge and we in the United States, who have lagged far behind in our own researches in pure science, have profited perhaps more than any other country.

"Even the magnificent laboratories which have been established by so many of our major industries have very largely confined their efforts to a practical application of the information furnished by the pure science research carried on in Europe," he continued. "Now they are in exactly the same position as that of the manufacturer who suddenly finds himself cut off from his supply of raw materials from which he fabricates his finished product. They are equipped for the study of applied science but not for the study of pure science on the results of which applied science is based. All human progress is dependent in the last analysis on the results of the studies of the scientist."

## Coke Production in September

The production of by-product coke during September amounted to 3,641,000 net tons, a decrease of 107,000 tons, or 2.9 per cent, when compared with the August output of 3,749,000 tons, according to the Bureau of Mines. September was a 30-day month, however, and the daily rate increased from 120,930 tons to 121,379 tons, or 0.4 per cent. There were 75 active plants, the same number as in July and August, and these plants produced a little more than 90 per cent of their total capacity.

The output of beehive coke during September showed a gain of 558,000 tons, or 74.2 per cent when compared with the preceding month, and was the highest monthly total recorded since February.

Of the total output of by-product coke in September 3,024,000 tons, or 83 per cent, was made in plants associated with blast furnaces.

## Bethlehem Net Profits Lower in Third Quarter

The Bethlehem Steel Corporation's net income for the third quarter totaled \$4,550,978, equivalent after the payment of preferred dividends to \$1.57 a share on 1,801,519 shares of common stock. This is lower than the profits of the preceding quarter, which amounted to \$5,348,023, or \$2.04 on common. In the third quarter of 1925 the net income was \$2,090,659, equal to 56c. a share on common stock.

President E. G. Grace announced that operations were at 80.3 per cent of capacity during the third quarter, compared with 82.6 per cent during the second quarter, and 59.5 per cent in the third quarter of 1925. Current operations are at the rate of 82 per cent of capacity, against 80 per cent this time last year.

Exports of mining machinery from the United States to the British Islands of Trinidad and Tobago rose from \$760,321 in 1923 and \$773,735 in 1924 to \$980,949 in 1925. The United States supplied 79 per cent of the mining machinery imports in 1925. Most of the mining machinery was for the petroleum industry.

### Exports of Iron and Steel from the United States

(In Gross Tons)

	September		Nine Months Ended September	
	1926	1925	1926	1925
Pig iron .....	2,173	3,349	16,628	22,844
Ferromanganese .....	119	21	513	4,101
Scrap .....	5,762	4,940	82,830	62,185
<i>Pig iron, ferroalloys and scrap .....</i>	<i>8,054</i>	<i>8,310</i>	<i>99,971</i>	<i>69,130</i>
Ingots, blooms, billets, sheet bars, skelp..	10,745	7,610	67,052	54,950
Wire rods .....	1,824	576	13,326	16,190
<i>Semi-finished steel..</i>	<i>12,569</i>	<i>8,186</i>	<i>80,378</i>	<i>71,140</i>
Steel bars .....	11,199	8,790	101,228	82,386
Alloy steel bars .....	166	146	3,728	2,853
Iron bars .....	771	343	3,909	2,877
Plates, iron and steel..	10,117	6,160	102,901	75,556
Sheets, galvanized....	12,865	12,875	130,146	122,571
Sheets, black steel....	9,727	12,007	125,608	65,794
Sheets, black iron....	1,176	841	14,215	10,175
Hoops, bands, strip steel	3,162	3,812	35,810	29,676
Tin plate; terne plate..	26,608	12,245	162,935	113,344
Structural shapes, plain material .....	12,939	7,591	120,100	68,656
Structural material, fabricated .....	6,674	5,822	63,446	50,882
Steel rails .....	19,448	9,611	131,013	130,833
Rail fastenings, switches, frogs, etc.	4,491	2,982	32,428	29,556
Boiler tubes, welded pipe and fittings..	24,825	19,211	203,453	186,875
Plain wire .....	1,921	2,290	25,880	27,365
Barbed wire and woven wire fencing .....	3,825	4,872	43,172	53,207
Wire cloth and screening .....	143	104	1,513	1,327
Wire rope .....	444	226	3,663	3,386
Wire nails .....	900	777	3,158	3,737
Other nails and tacks	636	681	6,385	6,856
Horseshoes .....	26	41	474	542
Bolts, nuts, rivets and washers, except track .....	1,221	1,236	10,442	13,044
<i>Rolled and finished steel .....</i>	<i>153,284</i>	<i>112,663</i>	<i>1,331,607</i>	<i>1,085,498</i>
Cast iron pipe and fittings .....	2,563	3,473	25,454	22,866
Car wheels and axles..	3,053	1,023	13,812	15,252
Iron castings .....	753	1,553	7,111	8,094
Steel castings .....	373	239	6,082	3,537
Forgings .....	270	126	2,260	1,738
<i>Castings and forgings</i>	<i>7,012</i>	<i>6,414</i>	<i>54,719</i>	<i>51,487</i>
All other .....	1,152	1,181	10,284	9,419
<b>Total .....</b>	<b>182,071</b>	<b>136,754</b>	<b>1,576,959</b>	<b>1,306,674</b>



## To Promote the Use of Steel

(Continued from page 1282)

gard to structures like buildings in which, if of steel, the metal is not everywhere accessible, it was said "In such a case it is undeniable that the steel is just as accessible as the reinforcing rods in reinforced concrete; in fact more so. Therefore, I would prefer steel for buildings."

It was pointed out, however, that there still remain a multitude of other uses for concrete and reinforced concrete, as for foundations, mass work in general, walls, abutments, piers or their backing dams, etc. "Why not use each material where it is most suitable and reliable?" he asked. "I therefore give to you fabricators of steel the slogan: Steel for strength and security—and you may add reliability."

**T**HE strength, durability, economy and effectiveness of steel as a structural material were also set forth in an address by John A. Crook, president of the Denver Steel & Iron Works Co., Denver, in an address on "Structural Steel and its Relation to Competition."

Bradley Stoughton, professor in charge of the department of metallurgical engineering, Lehigh University, Bethlehem, Pa., made a forceful presentation of the "Merits and Advantages of Steel," at the closing session of the meeting.

### No Limit to Life of Properly Protected Structural Steel

**P**ROPER design and construction, suitable protection and reasonable inspection and maintenance, including good painting and cleaning, as well as reasonable attention to severe conditions, such as salt air, continued fogs, acid fumes, corrosive liquids, should insure for all steel structures a life that is practically unlimited by corrosion.

This is the conclusion reached by Frank W. Skinner, consulting engineer, New York, after a thorough investigation, the results of which were briefly outlined in an address on "Corrosion as Related to Structural Steel."

F. N. Speller, metallurgical engineer National Tube Co., Pittsburgh, briefly discussed Mr. Skinner's paper, and also spoke briefly at the last session of the meeting. It was voted to suggest to the board of directors of the institute that consideration be given to cooperation with other societies in a study of corrosion, along the lines outlined by Mr. Speller.

"Some Possible Economies in Steel Construction," an address by C. R. Young, professor of structural engineering, University of Toronto, was well received. Dr. Wilbur J. Watson, president Watson Engineering Co., Cleveland, spoke on "Better Architectural Design in Steel Bridges," and Harvey Wiley Corbett, Helmle & Corbett, New York, gave an illustrated talk at the annual banquet on the subject of "Architectural Design of the Future."

Considerable interest was shown in the fireproofing of structural steel, and a paper on the subject was presented by R. N. Miller, consulting engineer, New York. F. E. Schmitt, associate editor of *Engineering-News-Record*, New York, interestingly recounted the results of his investigation of the effect of the recent Miami, Fla., hurricane.

### Study Needed Before Replacing Riveting by Welding

**S**TRUCTURAL steel is made under careful manufacturing conditions and has physical properties that are more definite than are the physical properties of any other structural material, said Milo S. Ketchum,

dean of the college of engineering and director of the engineering experiment station of the University of Illinois, in a paper on "Research Investigations in Connection with the Structural Steel Industry."

"In addition," he said, "structural steel more nearly conforms to the conditions assumed in the development of the theory of elasticity than does any other structural material."

"While structural steel is a superior structural material, there has been relatively little comprehensive research in structural steel design as compared with other structural materials, with resulting detriment to the building industry," said Dr. Ketchum.

The requirements of structural design were outlined and also the effect of carbon, phosphorus and other elements in structural steel. Other sections of the paper were devoted to fatigue phenomena of structural steel, impact stresses, and secondary stresses. In discussing riveted joints it was said: "While the action of riveted joints under normal conditions of stress is quite well known, additional tests should be made to determine the reversal of stress and the distribution of stresses in large gusset plates."

It was pointed out that rapid progress is being made in the welding of steel structures. "Research investigations of welding structural steel would appear to have three different divisions, as follows, said Dr. Ketchum. 1. An investigation of welded joints including a method of making field tests of welded joints. 2. An investigation of the physical, chemical and metallurgical phases of the problem, including a study of the weld and the material adjacent to the weld under different conditions of impact, secondary stress, repeated stress, over-stress, etc. 3. An investigation of welding as applied to the fabrication and erection of articulated steel structures for bridges, buildings and other frameworks."

"The allowable stresses, details of design, methods of erection and other phases of steel structures with riveted connections are controlled by specifications that are the result of experimentation and experience in the shop and field and in service. While the tests and experience with welded structures would appear to indicate that welding has an important place in the fabrication and erection of steel structures, much study, investigation, and experimentation will be necessary before welding can be generally adopted in place of riveting."

"From this discussion it would appear entirely probable that riveted connections will continue to be used for heavy frameworks for bridges and buildings, and where difficult erection problems occur and for structures of complicated design where it is necessary to design for deflection stresses. It should be remembered that a riveted structure has sufficient flexibility to change its form to take the load, while the welded structure with its more rigid joints will lack this flexibility. It would appear, therefore, that the economic design of articulated welded structures will require that the stresses be calculated with greater accuracy and that the design be made with greater skill than is necessary in the design of riveted structures."

Torsional stresses in steel members, steel column research and rolled beams were taken up in succeeding sections of Dr. Ketchum's paper, which is concluded by an account of a series of tests on the junior beams of the Jones & Laughlin Steel Corporation.

## Discuss Use of Welding in Structural Field

**I**NTEREST was shown in the presentation of the "Fundamentals of Welding and Their Possible Application in the Structural Field" by W. Spraragen, secretary of the division of engineering and industrial research, National Research Council, and secretary of the American Bureau of Welding, New York.

Every engineer who has carefully studied welding must admit, said Mr. Spraragen, that good welding can be done if certain established principles are followed. Failure is likely to occur if one of these principles are ignored. These fundamental principles were discussed at length under seven general headings: Design; mate-

rial; welding wire; apparatus; welding operators; technique of welding; and inspection and testing.

"Structures and parts of products which it is intended to weld must be properly designed to conform with the technique of welding in order that they shall effectively withstand the stresses which they will meet in service," said Mr. Spraragen. "It is a wrong basic principle simply to substitute welding for riveting in a structure originally designed for welding." Another element which it was said should be considered in the design of welded structures is making the greatest possible use of automatic and semi-automatic welding apparatus. The designing staff should have proper regard for the difficulty of making sound welds in small angular openings.

One advantage pointed to in favor of welding is that alterations or additions are easily accomplished. The high degree of accuracy necessary to insure rivet holes matching each other in a big structure is not always required in welding.

Probably the greatest saving which will be effected by the use of welding in the fabrication of structures, said Mr. Spraragen, will be in the savings of steel members to accomplish the same purpose. For example, a riveted girder is treated as a beam supported at the two ends, whereas a welded girder may be treated as a continuous beam or one "fixed" at the two ends, providing, of course, the continuity is also carried through the columns.

#### Draftsmen Will Have to Be Educated

"One of the greatest difficulties which will probably be encountered in the substitution of welding as a fabricating means will be in the educating of the drawing room staff," said Mr. Spraragen. "The drawings issued to the shops should give as much information with regard to the welding as would be the case were rivets being used. The size of the electrode, the number of runs and the lineal length of electrode to be deposited per unit length of weld must be given to insure the necessary quantity of metal being deposited. The method of indication would be more in the form of standard notes rather than by following the present expensive method of indicating on intricate drawings each rivet hole. It should be remembered that the same minute accuracy for locating the welds does not exist. The cross section of weld and a set of rules which will specify the size of electrode and current to be used for specific jobs may be all that is necessary."

The use of welding may bring about the necessity of changes in workshop routine. The use of jigs will be found advantageous and sometimes a necessity. These jigs, together with an oxy-acetylene cutter and welder, will eliminate work formerly performed by a templet maker, marker-off, punching and shearing machines.

It was stated that in general welding should result in the simplification of design. As the designing staff becomes more familiar with welding, it will be able to free itself from many of the limitations imposed by riveting, said Mr. Spraragen. The question of tolerances in ordering material for welded structures will undoubtedly be different than those in vogue at present.

Various types of apparatus, electric and gas, were briefly reviewed and it was stated that with the adoption of welding in shop fabrication, stationary types of spot welders undoubtedly will be developed. The co-operation of manufacturers in developing new apparatus for commercial needs may be fully expected, said Mr. Spraragen, and such development offers no insurmountable difficulties.

#### Welder Must Be Experienced for Particular Work

With the proper control and assuming conscientiousness and reasonable skill, the quality of a given product is fairly independent of the operator, said Mr. Spraragen in discussing the welding operator. On the other hand, he must be experienced in depositing the metal in the most appropriate manner for the particular job at hand. The expertness of the operator can, in most cases, only be tested by physical tests to destruction of test specimens of the work he is doing. Once a welder has proved himself competent to do a particular job, it

rests upon the supervisory and inspecting force to see that the quality of his work is maintained.

The technique of welding, it was pointed out, should be worked out carefully by engineers and foremen for each particular application. The wrong procedure in executing a welded job will often cause a failure in spite of the fact that all the other fundamentals have been rigidly observed. The exact amount of metal to be deposited should be specified, as well as where such deposits are made. The size of the electrode and welding wire and the corresponding currents and size of torch tip should be carefully worked out for each class of work and become standardized practice. The inspection force should see that such standard rules are followed out in detail. This should cover such information as number of layers; allowance for contraction and expansion, if any; order of welding, etc.

The importance of proper inspection and supervision, it was said, cannot be overemphasized. Prior to the last few years almost every article and book on welding directly or indirectly implied that the quality of the product was 90 per cent dependent on the skill of the welding operator.

With the methods in vogue up to the last two or three years, this statement was probably fairly correct, said Mr. Spraragen, as in most cases the selection of material, the design and the technique of the work were left to a considerable extent to the welding operator.

When the problem of material, design and technique are worked out in advance, the welding operator is only called upon to manipulate the electrode to do a particular job. When relieved of these other responsibilities the welding operator can, after a little training, be depended upon to do the work day in and day out with no greater percentage of variation in quality than is found in riveting. This, of course, presupposes the existence of a competent inspecting and supervisory force.

#### Welding Vs. Riveting

The greatest handicap to welding is stated by many authors to be that we have no satisfactory non-destructive tests available to check the quality of the weld. Many conservative engineers argue that after a job is finished it is impossible to know with certainty whether it is a 50 or 100 per cent strength weld. Proponents of welding in turn answer that it is equally impossible to know the strength and quality of a finished rivet job, the only difference being that we have grown accustomed to be satisfied with minor tests of a riveted joint instead of requiring a test to destruction. This is because riveting has been with us for a long period, the processes have become standardized, and we have learned from experience to place confidence in the product. The same psychological process is taking place with welding. However, whereas the riveting art has been practiced for centuries, we have only been using welding extensively for seven or eight years.

The structural engineer is inclined to look with suspicion upon a single weld which carries enormous loads and where failure might result in damage to life and property. While he knows that some rivets are imperfect, nevertheless he feels that because there are so many of them that even if 15 per cent were bad the structure would still be safe because of the factor of safety in the design.

If possible, welded parts should be designed so that there will be a large number of small welds to carry heavy loads instead of one large weld. The same arguments would then hold true as in the case of riveting. The use of automatic and semi-automatic machinery would remove this objection. The skilled inspector easily knows when the operator is doing good work. In the first place, the ammeter tells him whether proper current is being used for the job, and the voltage across the arc will seldom exceed 22 volts if good work is being done. A long arc results in improper fusion and lack of proper penetration. A long arc is easily recognized not only by the higher voltage, but by the "flame" effect. The quality of workmanship is also readily discernible in gas welding. The appearance of the weld after the work is finished furnishes some indication of the quality.



Several examples of what has been done in welded structures were shown by lantern slides and discussed.

In concluding his paper Mr. Spraragen stated that, in his opinion, a combination of welding and riveting can be used to advantage in present fabrication of structural steel. "With the gradual gaining of confidence and knowledge in welding methods, the use of welding in this field will be gradually extended," he said. "Structural steel executives should inform themselves of the possibilities of welding and give it a fair trial, even though on a small scale at first, as a means of fabrication.

#### Claims Riveting is More Dependable

**C**OMPARISON of riveting with the present status of welding was made by A. F. Jensen, president of the Hanna Engineering Works, Chicago, in a paper following Mr. Spraragen's presentation of welding data.

"Riveting is one of the oldest arts and there are no intangibles when considering its application," said Mr. Jensen. Accurate data are available regarding every phase and type of riveting; inaccurate assumptions on the riveting side of the comparison are inexcusable. Welding, however, has not progressed to a point where authentic data are available, leaving this side of the comparison to be based upon assumptions.

"It is evident the manufacturers of welding equipment have determined the labor cost of making a seam of given length and kind, which cost is merely one factor of the final cost. The determination of this final cost should naturally rest with the structural steel industry.

"Claims of lower costs and superiority of product must be demonstrated by actual performance of plant and equipment wherein welding is used for joining plates, shapes, bars, etc., of the type constituting the nation's tonnage.

In discussing the dependability of welding, items in trade and other papers were read to show the occurrence of failures of welded joints in boilers, air receivers, etc.

"The rivet is the most reliable and dependable element of the engineering field," said Mr. Jensen. "Riveted structures which have been in service for years give testimony to this fact, and any reference to the few instances where rivets have become loose is not constructive analysis. . . . A properly designed riveted joint will not move unless the stress far exceeds that for which it was designed. Testing by tapping discloses a rivet which doesn't grip the plates even though the rivet fills the hole. Rivets which will not pass the tapping test may be tightened, even when the rivets are cold. . . . To attack the dependability of a riveted joint is to question the intelligence and the experience of the steel construction industry. The gradual deterioration, and it is decidedly gradual, of a riveted joint will give forewarning of its deterioration long before actual failure, whereas a weld will give no warning whatsoever, nor is its failure gradual.

#### Rivets Properly Set Regardless of Operator

"Approximately 150 rivets are required per ton of structural steel. Machine driven rivets predominate. Each and every stroke of the compression yoke riveter sets the rivet with a predetermined tonnage produced irrespective of the judgment and skill of the operator, and with the certainty that sufficient pressure has been exerted on each rivet.

"There is nothing a riveter operator can or cannot do to reduce appreciably the value of a rivet without evidence that can be quickly detected by inspection; a burned rivet can be identified by appearance and a loose rivet by tapping. . . . Because of the human factor in welding, no weld is better than the welder.

"Methods and machinery used in riveting have practically eliminated the necessity for skilled workmen. . . . The supply of riveter operators is limited only by the supply of unskilled labor.

"One of the great advantages of riveting is in the aligning and locating value of the matched rivet holes. They predetermine the squareness of the structure irrespective of the erectors. Rivet holes are

located in the shop where their accuracy may be established with certainty and economy, and with the assurance that the discriminating plans of the designing engineer are conformed to in the field. They establish location, level and squareness surely and quickly."

#### Riveting Art Not at Standstill

In referring to the large amount of space given in various publication to forecasts of the possible achievements by the adoption of welding, Mr. Jensen said: "To compare this possible future development of welding with riveting practice as it now exists is to assume that the riveting art is at a standstill, an assumption not justified.

"In the riveting art we may look forward to the introduction of portable yoke riveters, much higher than the machines now in use; alloy steel riveting; the acceptance of cold riveting; power actuated mechanical devices for the manipulation of riveters on straight run work whereby the buckler-up is eliminated and the operator controls two or more riveters merely by the manipulation of valves, making it possible for a crew of four men to drive at least 50 rivets per minute; and the introduction of multiple riveting machines which will drive at least a dozen rivets for each operation cycle. A combination of cold riveting and multiple riveters constitutes the most promising possibility for the reduction of structural steel fabricating costs."

"There is a field of usefulness for both welding and riveting," said Mr. Jensen in the concluding section of his paper. "The dependability of riveting and its contribution to engineering progress are reflected in every direction, and mere claims and propaganda for a radically different new method will not supplant it.

"The conservation of human life and limb is a solemn duty not to be influenced by possible economies promised for a new method. The much discussed din of the riveting hammer is preferable to the possible loss of human life and property."

At the same session A. M. Candy, welding engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, outlined the results of a series of tests recently conducted at the Carnegie Institute of Technology on welded and riveted structural members, using slides to illustrate his address.

#### Lycoming Mfg. Co. Elects Officers

At the Sept. 30 board meeting of the Lycoming Mfg. Co., Williamsport, Pa., James B. Graham, formerly president, was elected chairman of the board; John H. McCormick, formerly general manager, was elected president and general manager and W. H. Beal, formerly sales manager, was named secretary and sales manager.

During the first eight months of 1926, 33 per cent more motors were produced than during the same period in 1925. The production during these first eight months was almost equal to the entire 12 months' production in 1925, although the total 1925 production was over 100 per cent greater than in 1924.

#### Instructs Staff in Overhead Conveying

During the week of Oct. 25 a meeting of sales representatives, for instruction in overhead conveying and in the sale of Cleveland electric tramrail, was held at the office and factory of the Cleveland Crane & Engineering Co., at Wickliffe, Ohio. The instruction included manufacturing processes, stereopticon lectures on material handling principles and detail of tramrail installations and equipment, talks on sales and advertising policies and practice and inspection tours in Cleveland and surrounding territory of plants in which tramrail is being used.

Those attending were: A. G. Raddatz and M. D. Patterson, Muskegon, Mich.; I. H. Burkart, Philadelphia; A. M. Wright and Robert Birkin, Chicago; Paul Sarver, Fort Wayne, Ind.; F. H. MacElvain, Birmingham; William S. Bowers, William E. Bowers and William K. Rait, Columbus, Ohio; G. W. Bacon, Rochester, N. Y.; G. C. Curtiss, Chicago; John Ryder, Toronto.

# Machinery Markets and News of the Works

## OCTOBER SALES FAIR

### Bookings Equal or Approach September Total in Some Centers

#### Cincinnati Manufacturers Estimate 50 to 70 Per Cent of Trade Is from Automotive Industry

OCTOBER sales of machine tools proved larger than was expected in view of reports received early in the month. At Cleveland and New York sales totals were approximately equal to those of September; at Cincinnati they were as large and, in some instances, larger than in the previous month. Chicago reports that bookings were slightly below normal and equaled about 80 per cent of the business entered in October a year ago. Quiet conditions continue to prevail at Pittsburgh and New England. While a slight improvement in sales is reported from Boston, business is described as far from good.

## New York

NEW YORK, Nov. 1.

ALTHOUGH the early weeks of October were not particularly active in the machine tool business, new inquiries and purchases in the latter part of the month have probably been of sufficient volume to make it, as a whole, compare favorably with September. Inquiry for single tools continues good, although purchases in the past week have not been numerous. The New York Central is still the most active railroad buyer in this district and closed in the past week on another gap lathe and two 27-in. x 16-ft. engine lathes. In addition to other inquiries it has a list of three 30-in. lathes that has been pending for several weeks.

Industrial users of machine tools have been fairly active purchasers. The Ferracute Machine Co., Bridgeton, N. J., has closed on a large gear cutter, the Bethlehem Steel Co. on a vertical bar punch, the Hudson Coal Co., Scranton, Pa., on a 60-in. x 23-ft. engine lathe, the Singer Mfg. Co. on a 15-in. automatic milling machine, Warner & Swasey Co. and the American Tool Works each on a vertical surface grinder. A New Jersey company, which closed on seven Multi-Cut lathes a week ago has purchased three more 16-in. Multi-Cut lathes. A Chicago company has purchased a 6-ft. radial drill, a Magneto manufacturer at Sidney, N. Y., two automatic milling machines, a Waterbury, Conn., brass company, a 16-in. engine lathe, a Brooklyn, N. Y., manufacturer an engine lathe, a machine tool maker at Joplin, Mo., a vertical shaper, a Detroit automobile plant two deep hole drilling machines, a Baltimore company a jig borer, and a Franklin, Pa., manufacturer a jig borer and a centering machine.

The Neptune Meter Co., 50 East Forty-second Street, New York, manufacturer of water meters, has begun the construction of a new plant at Long Island City, to be three-stories, 40 x 40 ft., with wing, 50 x 125 ft., for which a general contract recently was let to C. Curtis Woodruff Co., 213 Tenth Avenue, Long Island City. It will cost about \$125,000 with equipment. W. W. Knowles, Electric Building, Long Island City, is architect.

Cincinnati manufacturers of machine tools estimate that 50 to 70 per cent of their business has come from the automotive industry, and in view of several important inquiries pending, additional orders from that source are expected this month. Only a moderate volume of orders has come from the general industrial field, and railroad buying at Cincinnati has been negligible. At New York, however, the New York Central Railroad has been an active buyer, placing an additional gap lathe and two 27-in. x 16-ft. engine lathes, and is expected to close soon against inquiries still pending.

While few orders from the automobile industry have been placed in the Cleveland market, a turret lathe manufacturer's October sales showed a gain over those of September. Most current business at Cleveland consists of orders for individual machine tools coming from widely scattered sources. At Pittsburgh the Westinghouse Electric & Mfg. Co. is buying against its quarterly list. The General Electric Co. has closed against a sizable list for Fort Wayne, Ind.

Johns-Manville, Inc., Madison Avenue and Forty-first Street, New York, manufacturer of roofing, pipe-covering, etc., is planning for expansion at its plant at Gretna, La., including the installation of considerable additional machinery. It is understood that the company has arranged to build a quantity of the required equipment at its works at Waukegan, Ill. W. R. Seigle is vice-president.

The Electrical Securities Corporation, 31 Nassau Street, New York, operating electric light and power properties, a subsidiary of the General Electric Co., Schenectady, N. Y., is disposing of a bond issue of \$1,000,000, a portion of the proceeds to be used for expansion. C. N. Mason is president.

The Standard Oil Co. of New York, 26 Broadway, is carrying out an expansion program for its subsidiary, the Magnolia Petroleum Co., with headquarters at Dallas, Tex., to include the installation of gasoline refining equipment at several smaller plants and the refinery at Fort Worth. Additional pipe lines will also be constructed. A similar program will be carried out for the General Petroleum Co., another subsidiary, with main offices at Los Angeles.

F. A. D. Andrea, Inc., 1581 Jerome Avenue, New York, manufacturer of radio equipment, will soon ask bids on a general contract for a four-story plant, 159 x 225 ft., to cost approximately \$350,000 with equipment. The project will be carried out in the name of the Andrea Holding Co., a subsidiary. The Ballinger Co., 100 East Forty-second Street, is architect and engineer. F. A. D. Andrea is head of both companies.

The Adirondack Power & Light Corporation, Amsterdam, N. Y., has acquired an interest in the Port Henry Light, Heat & Power Co. The new owner is completing plans for extensions and betterments in the hydroelectric power station of the Port Henry company, including the installation of additional equipment. Transmission lines will also be extended.

The Merchants Airdrome & Garage, Preakness, N. J., contemplates rebuilding the portion of its airplane and automobile repair and equipment shop and garage, destroyed by fire Oct. 10 with loss reported at \$50,000.

The City Commission, City Hall, Newark, has approved an additional appropriation of \$215,000 for its proposed new municipal power plant. With a previous fund of \$200,000 this makes a total of \$415,000 available for the plant, including equipment. It is purposed to begin work soon. J. S. Jigott, 14 Park Place, is architect.

The Hayes Mfg. Co., Port Jervis, N. Y., has been incorporated with a capital of \$200,000 for the manufacture of electric shears and parts. The company's factory is at



Matamoras, Pa. It will probably be in the market for material and equipment.

The Crescent Washing Machine Co., New Rochelle, N. Y., maker of electric dish and glass washers, effective Nov. 1, will be known as the Crescent Washing Machine Division of the Hobart Mfg. Co., Troy, Ohio, but operations will be continued at New Rochelle.

The Detachable Bit Corporation of America, 25 Broadway, New York, has been organized with capitalization of 100,000 shares of no par value common stock for the manufacture of Thurston detachable rock drill, bits, couplings and shanks for rock drilling. For the present its manufacturing will be negotiated through contract, but later it will be in the market for certain brands of alloy steels.

## Buffalo

BUFFALO, Nov. 1.

**C**ONTRACT has been let by the Delaware & Hudson Co., 32 Nassau Street, New York, to the Austin Co., for a new one-story machine shop at Oneonta, N. Y., to cost about \$175,000 with equipment.

The Kellogg Products Co., Inc., 1317 Elk Street, Buffalo, manufacturer of linseed oil, etc., has awarded a general contract to the White Construction Co., 95 Madison Avenue, New York, for a new three-story plant, 100 x 150 ft., at Edgewater, N. J., to cost about \$200,000 with machinery. Plumer & Mann, Buffalo, are architects and engineers. Howard Kellogg is president.

The Morse Chain Co., Ithaca, N. Y., manufacturer of transmission equipment, has work under way on a five-story addition at its local plant, totalling about 210,000 sq. ft. of floor space.

The Board of Education, Oneida, N. Y., contemplates the installation of manual training equipment in its proposed two-story high school addition to cost about \$300,000, for which bids will soon be asked on a general contract. Wilson Potter, 22 East Seventeenth Street, New York, is architect.

## Chicago

CHICAGO, Nov. 1.

**R**EPORTS of machine tool business in this territory vary, but it is evident that the automotive industry has added materially to some dealers' books. Fresh inquiry is only moderately active and is widely scattered, although in larger volume than early in the month. October sales of representative local machinery houses were slightly below normal, but probably were equal to 80 per cent of those for October, 1925.

There is a tendency on the part of the railroads to place the few remaining tools left over from lists published earlier in the year. The Santa Fe will probably close out its 1926 list within a few days. Requirements of the Illinois Steel Co. and the Pullman Co. are still in the hands of the engineering departments and dealers have no intimation as to when orders will be placed. An order for a 12-in. x 6-ft. lathe from the Fort Wayne list of the General Electric Co. has been received by a Chicago dealer.

The Vulcan Last Co., Portsmouth, Ohio, manufacturer of iron shoe lasts, etc., has awarded a general contract to C. J. Moritz, Inc., Parker Building, Effingham, Ill., for a one-story branch plant at Effingham, 150 x 750 ft., to cost \$125,000 with equipment. William Burke is president.

The Sundstrand Corporation, 2400 Eleventh Street, Rockford, Ill., manufacturer of mechanical equipment, is considering the erection of a one-story machine shop, 116 x 130 ft., to cost approximately \$25,000 with equipment. It is purposed to begin work early next year. P. A. Peterson is head.

The Economy Pumping Machinery Co., Chicago, has work in progress on a new plant at Forty-eighth Place and St. Louis Avenue, to cost \$60,000 and will have the structure ready for machinery installation at an early date.

The Keokuk Steel Casting Co., M and Commercial Streets, Keokuk, Iowa, has awarded a general contract to the Michelmann Steel Construction Co., Quincy, Ill., for a one-story foundry addition, 36 x 280 ft., to cost approximately \$30,000 with equipment. J. C. Bode is general manager.

The Nye Tool & Machine Works, 4120 West Fullerton Avenue, Chicago, will proceed with the erection of a one-story addition, 100 x 100 ft., reported to cost about \$50,000,

for which a general contract recently was let to the Frank Stowell Co., 115 South Dearborn Street.

The Chicago & Illinois Midland Railway Co., Taylorville, Ill., is said to have plans under advisement for a one-story addition to its local car shops, 50 x 200 ft., to cost approximately \$80,000 with equipment.

A. S. Alschuler, 28 East Jackson Boulevard, Chicago, architect, has completed plans for a one-story automobile service, repair and garage building, 200 x 300 ft., to cost in excess of \$100,000 with equipment.

The Lincoln Steel Co., Chicago, sales agent for Armco sheet steel and ingot iron, has removed its general offices and warehouse from 2320 West Fifty-eighth Street to 229 West Illinois Street where attention can be given to the production of Koro welding wire for the welding trade.

Sisler Triple Seal Valve, Inc., has been organized with a capitalization of \$100,000 for the manufacture of the Sisler triple seal valve, designed especially for automobile inner tubes. Its present address is 300 California Building, Denver, Colo.

## Cincinnati

CINCINNATI, Nov. 1.

**L**OCAL machine tool builders report that October was satisfactory both from the standpoint of new business and of production. With only one or two minor exceptions sales either paralleled or exceeded those in September. Even those plants which received a particularly large volume of orders during September did not experience any appreciable decrease in the past month. Cincinnati manufacturers estimate that from 50 to 70 per cent of their business has come from the automotive industry. In several cases orders from that source run as high as 80 per cent. The general industrial field has yielded a moderate amount of business, but railroad buying has been negligible. Automobile makers in the Detroit district are expected to place sizable orders in the next month, several important inquiries now being before the trade.

Bookings by Cincinnati builders are in sufficient volume to insure the continuation of operations on the present satisfactory basis throughout November. An Eastern company has bought three automatic lathes in this market, while a manufacturer in Hartford, Conn., has taken a 42-in. carwheel borer. A local dealer has sold a 14-in. grinder and a 6-in. x 20-in. thread miller to companies in this city. A Richmond, Ind., concern has purchased a Pratt & Whitney jig borer.

The Tischer-Taylor Mfg. Co., Fifth and Norwood Streets, Dayton, Ohio, has been incorporated to manufacture inlaid wood steering wheels on which the company has basic patents. Production will be started at once. The plant has a daily capacity of 300 wheels. F. V. Tischer and C. E. Taylor are among the incorporators.

The Inland Mfg. Co., Coleman Avenue, Dayton, subsidiary of General Motors Corporation, has awarded a general contract to Frank Hill Smith, Inc., local, for a one-story, brick and steel factory to cost approximately \$250,000. The structure will be given over to the manufacture of molded products, including hard and soft rubber products.

The General Box Co., Chicago, has purchased a 10-acre tract at Moraine City, Ohio, near Dayton, and soon will erect a factory. The company supplies a considerable portion of its output to the Frigidaire Corporation, the plant of which is near the site of the proposed structure.

The Royal Blue Bed Spring Co., Dempsey Street and the Baltimore & Ohio Railroad, Cincinnati, has awarded a general contract to the H. C. Hazen Construction Co., Reading Road, for a new one-story plant estimated to cost \$140,000 with equipment. Bert Baldwin, Second National Bank Building, is architect.

Fire recently damaged the factory branch of the J. I. Case Threshing Machine Co., Lexington, Ky., occupying a building under lease, with loss reported at \$20,000. Headquarters are at Racine, Wis.

The Bock Machine Co., 3618 Colerain Street, Cincinnati, has filed plans for a one-story machine shop addition.

The Goldsmith Metal Lath Co., Third Street and Eggleston Avenue, Cincinnati, is taking bids on a general contract for a one-story plant, 80 x 300 ft., to cost about \$50,000. Gustave W. Drach, Union Trust Building, is architect. Max S. Goldsmith is president.

The United States Cast Iron Pipe & Foundry Co., Chat-

## The Crane Market

THE overhead crane field continues unusually quiet with only a few single crane inquiries before the market and but little buying reported. A few locomotive crane inquiries are active and in the past week, in addition to a few single purchases, the New York Central closed on four of the locomotive cranes on its list. Only a few purchases of overhead equipment are noted.

Among recent purchases are:

New York Central Railroad, New York, four locomotive cranes reported distributed as follows: Two for the East to the Industrial Works; one for Bucyrus, Ohio, to the Ohio Locomotive Crane Co.; one for Cleveland to the Browning Crane Co. and one standard railroad ditcher to the American Hoist & Derrick Co.

Missouri Pacific Railroad Co., St. Louis, a 25-ton locomotive crane from the American Hoist & Derrick Co.

Taylor-Colquitt Co., Spartansburg, S. C., a 15-ton locomotive crane from the American Hoist & Derrick Co.

Gulf Refining Co., New York, a 5-ton, 37-ft. 8-in. span, 1-motor overhead crane for Boston, from the Box Crane & Hoist Corporation.

Ideal Marble Co., Union City, N. J., a 3-ton, 22-ft. span hand power crane from the Box Crane & Hoist Corporation.

Metal & Thermit Corporation, Chrome, N. J., two 3-ton, 27-ft. span geared trolleys, reported last week as placed with the Box Crane & Hoist Corporation, awarded to the Chisholm-Moore Mfg. Co.

tanooga, Tenn., will build a new one-story crane runway addition, 60 x 600 ft., to cost close to \$40,000. Other equipment will also be installed.

The Gibsonburg Lime & Products Co., Gibsonburg, Ohio, has awarded a general contract to the Bellefontaine Steel Co., Bellefontaine, Ohio, for a new plant, to cost \$175,000 with equipment. F. W. Zorn is head.

W. C. Ellis & Sons, 245 South Front Street, Memphis, Tenn., have plans for a one-story addition to their machine shop, to cost approximately \$18,000 with equipment.

The L. J. Breed Equipment Co., James Building, Chattanooga, Tenn., machinery dealer, has inquiries out for an 8-wheel electric-operated locomotive crane, standard gage.

The Delco-Light Co., Taylor Street, Dayton, Ohio, manufacturer of electric lighting and starting systems, has filed plans for a one-story addition to cost about \$20,000.

James A. Glass, 99 Bedford Street, Boston, manufacturer of metal grille work, office partitions, etc., has leased property at 214 High Street. It is understood that the present works will be removed to the new location.

The Board of Trustees, Newton Hospital, Newton, Mass., has plans in progress for a new power house to cost more than \$100,000 with equipment. LeClear & Robbins, Boston, are architects.

The Thompson Wire Co., Mildred Avenue, Dorchester, Mass., has filed plans for a one-story addition, 65 x 150 ft., to cost about \$45,000 with equipment.

Edward Wilkinson & Co., Pine Street, Providence, R. I. general contractors and woodworkers, have acquired property at Georgia Street and Toronto Avenue, totaling about 15,000 sq. ft. of floor space, and will remodel for a new plant.

## New England

BOSTON, Nov. 1

ASLIGHT improvement in machine tool sales is reported by local dealers. Providence dealers have had a good business, and Connecticut houses have shipped quite a number of machines outside of New England recently. Local prices on new tools are well maintained. Sales the past week included two plain milling machines to New York State users, a boring mill and an upright drill also to manufacturers outside of New England, two Pratt & Whitney lathes to a Massachusetts shop, all new machines; two used 14 in. x 6 ft. lathes to greater Boston users, a used boring mill to a Massachusetts plant, and a considerable list of bench equipment to local and near-by shops. New inquiries are scarce and for the most part call for single production machines.

The Underwood Machinery Co., 110 Mt. Vernon Street, Dorchester, Boston, has started construction of a one-story, 46 x 100 ft., manufacturing plant. Plans are private.

The city of Boston has completed plans for a one-story, 50 x 90 ft., elementary school on Wren Street, West Roxbury, to cost \$70,000 without equipment. A manual training department will be provided. Francis E. Slattery is chairman of the school house committee.

A. J. Halfenstine, 143 Washington Street, Brookline, architect, is preparing plans for a one-story, 55 x 77 ft., welding plant at 43 Brookline Avenue, Brookline, Mass., for David Miller.

Work will soon be started by the Wentworth Institute, Huntington Avenue, Boston, on a one-story, 30 x 60 ft., student's practice shop at Roxbury. Plans are private.

The Peck-Harris Co., Plainville, Conn., springs, has leased the former plant of A. N. Clark & Son. New machinery is being installed and other expansion plans have been made. It will specialize in flat springs. D. C. Peck, associated with the company, is president of the Peck Spring Co., coil springs.

Fred T. Ley Co., Inc., Springfield, Mass., and 230 Boylston Street, Boston, has leased space in the Statler Building, Park Square, Boston, for occupation about Nov. 1.

The W. A. Ives Mfg. Co., Wallingford, Conn., manufacturer of screw drivers, bits and kindred hardware specialties, is completing plans for a one-story addition, 65 x 245 ft., to cost close to \$70,000 with equipment. C. J. Benham is president.

## Pittsburgh

PITTSBURGH, Nov. 1.

WITH a few exceptions the general machine tool business in this district is quiet. One firm, in addition to a fair number of single tool sales, sold three combination punches and shears and one beam shear. The Westinghouse Electric & Mfg. Co. is buying fairly steadily against its quarterly list. Local dealers and agents are submitting quotations against the 1927 list of the Norfolk & Western Railway.

Work will begin on a new plant at Callery, Pa., for the National Metal Products Co., 1025 Chateau Street, Pittsburgh, to be one-story, 60 x 175 ft., estimated to cost close to \$45,000.

The Board of Education, Fulton Building, Pittsburgh, plans the installation of manual training equipment in its proposed three-story and basement junior high school on Center Avenue, estimated to cost \$1,000,000, for which bids have been asked on a general contract. James T. Steen & Sons, Vandergrift Building, are architects.

The Pittsburgh & West Virginia Gas Co., 435 Sixth Avenue, Pittsburgh, a subsidiary of the Philadelphia Co., same address, is reported to be planning the construction of pipe lines in different sections of the State, including pumping stations. One or more gasoline recovery plants are also planned. The entire project is expected to cost in excess of \$5,000,000. The Equitable Gas Co., another subsidiary, will soon begin the construction of a 20-in. pipe line.

The Standard Steel Specialty Co., Beaver Falls, Pa., has awarded a general contract to the H. V. Kirker Co., College Hill district, for its one-story addition, 60 x 94 ft., to cost \$35,000 with equipment.

The School District of North Braddock, 824 North Avenue, North Braddock, Pa. is considering the installation of manual training equipment in its four-story junior high school estimated to cost \$225,000, for which bids will soon be asked on a general contract. Carlisle & Sharrer, Martin Building, Pittsburgh, are architects.

The Charles H. Haney Lumber Co., Rochester, Pa., is having plans prepared for a new one-story structure, 115 x 150 ft., to be equipped primarily as a planing mill, to cost about \$45,000 with machinery. It is understood that the majority of the equipment will be electrically operated.

Motors, conveying machinery and other equipment will be installed in the proposed paper products plant of the Republic Bank Note Co., 2817 Forbes Street, Pittsburgh, estimated to cost \$275,000 with equipment. Hunting, Davis & Dunnells, Century Building, Pittsburgh, are architects.



## Detroit

DETROIT, Nov. 1.

**T**HE Fisher Body Co., Flint, Mich., has begun the erection of two additions to its local plant, one of which will be equipped as a power plant to cost \$120,000 with machinery. The other structure will cost close to \$200,000.

The March Irrigation Co., Western Avenue, Muskegon, Mich., manufacturer of irrigation equipment and supplies, has plans for a new one-story plant, 65 x 200 ft. A two-story office will also be built. The structures will cost close to \$60,000. Vander West & Child, Montgomery Building, are architects.

The Atkinson Spring Co., Hamburg, N. Y., manufacturer of steel springs, is reported to be contemplating the construction of a new plant at Holly, Mich., to cost about \$25,000. It is purposed to remove the Hamburg business to the new location.

C. W. Brandt, Kresge Building, Detroit, architect, has plans under way for a two-story automobile service, repair and garage building, 85 x 150 ft., to cost approximately \$85,000 with equipment.

The Calumet & Hecla Consolidated Mining Co., Calumet, Mich., is planning for the reopening of its former Avery shaft and will install new electrically-operated pumping equipment, air compressors and other apparatus.

The National Plating & Enameling Co., Jackson, Mich., has acquired the former local plant of the Earl Motors, Inc., consisting of five buildings on a 32-acre tract. The new owner will remodel the structures and will remove to this location where capacity will be increased. Additional equipment will be installed. J. A. Watson is president.

The Ford Motor Co., Detroit, will proceed with its proposed hydroelectric generating plant on the Huron River, near Ypsilanti, Mich., reported to cost in excess of \$1,000,000. Stone & Webster, Inc., 147 Milk Street, Boston, is engineer and contractor. The company also purposes to build a stand-by steam-operated power station at this location.

The White Star Refining Co., Detroit, is considering the construction of a new oil storage and distributing plant on property recently secured from the Michigan Central Railroad between Six-Mile Road and Davison, to cost in excess of \$80,000 with equipment.

The Grand Trunk Railway System, Pontiac, Mich., has arranged an appropriation of \$1,500,000 for the construction of a new terminal yard to the north of the city, with shop division including engine house, machine shop, power house and other structures.

The Flint Gray Iron Foundry Co., Flint, Mich., is completing the construction of an addition to cost in excess of \$50,000 with equipment.

## Cleveland

CLEVELAND, Nov. 1.

**A** FAIR volume of business continues to come out almost wholly in single machines. Orders are coming from widely scattered sources with very few from the automotive industry. There is some demand from public service companies for equipment for maintenance departments and several manual training schools in this territory are adding a little to their machine shop equipment.

Turret lathes are fairly active and sales by one local manufacturer in October showed a gain over September. Pending inquiries include one for eight large turret lathes from New England. Automatic screw machines are in fair demand but orders are mostly for one or two units. The demand for presses continues quite active. Taken as a whole, the volume of business in October was about the same as in September, but November starts with some slowing down in inquiries.

The Geometric Stamping Co., 199 East 131st Street, Cleveland, has placed contract with the Bolt & Rapp Co., for a one-story addition, 115 x 137 ft.

The Alliance Tank Co., Alliance, Ohio, has commenced the erection of a plant, 54 x 101 ft. All the equipment has been purchased.

The Western Stamping & Mfg. Co., St. Paul, Minn., has established a plant at 2789 East Eighty-third Street, Cleveland, for the manufacture of pressed steel signs. T. R. Willwerscheid is president.

The General Tire & Rubber Co., Akron, Ohio, has taken bids for a 100 x 240 ft. addition to its mill and calender department.

The Fanner Mfg. Co., Cleveland, has placed contract with the H. G. Slatmyer & Son Construction Co., for a one-story foundry addition, 30 x 135 ft.

The Champion Spark Plug Co., Toledo, Ohio, will erect a factory addition.

The Elwell-Parker Electric Co., Cleveland, has placed contract with the J. Boldt Construction Co. for a two-story brick and concrete addition.

The Forest City Foundry & Mfg. Co., 1220 Main Street, Cleveland, has placed a contract with the H. G. Slatmyer & Son Construction Co., for an addition, 60 x 150 ft.

The White Sewing Machine Co., Main and Elm Streets, Cleveland, has placed contract for a three-story factory to replace one recently burned.

## Philadelphia

PHILADELPHIA, Nov. 1.

**C**ONTRACT has been let by the Langshaw Motor Co., 1135 South Fifty-eighth Street, Philadelphia, I. Nagel, in charge, to W. R. Smithwick, Kenmore Avenue, Brookline, Pa., for a two-story and basement service, repair and garage building, 50 x 120 ft., to cost close to \$100,000 with equipment.

The Quaker City Cold Storage Co., Water and Spruce Streets, Philadelphia, has plans under way for general expansion, including the construction of a new multi-story cold storage and refrigerating plant on adjoining site, estimated to cost \$1,700,000 with equipment. It will also take over the cold storage and refrigerating division of the new joint terminal warehouse of the Philadelphia & Reading and the Baltimore & Ohio Railroads, now in course of construction. In addition, the company will operate the plant of the Delaware Storage & Freezing Co., 211 Callowhill Street. In connection with these projects, the Quaker City company will develop an ice-making capacity of 245 tons per day at the different plants, and purposes to extend operations to include new plants outside of the city. To provide for immediate expansion, the company is disposing of bond issues to total \$3,250,000. Horace P. Serrill is president. Day & Zimmerman, Inc., Sixteenth and Walnut Streets, is engineer.

E. J. Lafferty, director, department of supplies, room 312, City Hall, Philadelphia, is asking bids under Nov. 8 for a steel percolator tank, class 234; also, for snow scoops, class 230.

The Davis-Buick Co., 312 West Chelton Avenue, Philadelphia, has awarded a general contract to Stofflet & Tillotson, Wesley Building, for a new two-story service, repair and garage building, 190 x 211 ft., to cost about \$155,000 with equipment. Stewart C. Barnett, Harrison Building, is engineer. C. H. Davis is head.

The Keystone Supply & Mfg. Co., 927 North Ninth Street, Philadelphia, is completing plans for a one-story and basement pipe shop and shed at Camden, N. J., 95 x 100 ft. Frank E. Hahn, Seventh and Chestnut Streets, Philadelphia, is architect.

V. B. Smith, Guarantee Trust Building, Atlantic City, N. J., architect, has awarded a general contract to the Ingersoll Construction Co., Linwood, N. J., for a three-story automobile service, repair and garage building, 40 x 112 ft., to cost about \$70,000 with equipment.

The Pennsylvania Railroad Co., Philadelphia, has plans for extensions and improvements in its repair shops at Lucknow, Pa., which will provide facilities for the employment of more than 200 additional men. The work will include a new reclamation department. H. H. Garrigues is general superintendent at Harrisburg.

The Board of Education, Kingston School District, Kingston, Pa., plans the installation of manual training equipment in its proposed two-story and basement senior high school to cost \$650,000, for which bids on a general contract will be asked early in November. Mack & Sahn, Coal Exchange Building, Wilkes-Barre, Pa., are architects.

The Continental Can Co., 1 Pershing Square, New York, has awarded a general contract to Grange & Goebel, Washington Trust Building, Washington, Pa., for its two-story plant at Canonsburg, Pa., 80 x 100 ft., to cost approximately \$100,000 with equipment. Francisco & Jacobus, 511 Fifth Avenue, are architects and engineers.

The Russell, Burdall & Ward Bolt & Nut Co., Port Chester, N. Y., is reported to be contemplating the construction of a new one-story plant at Coraopolis, Pa., where a site has been selected near the Sewickley Bridge.

The Wilmington Pattern & Mfg. Co., Newport, Del., has just completed and equipped a new building for the manufacture of wood and metal patterns. It is of concrete and steel, 50 x 70 ft., adjoining the Pennsylvania Railroad. All

of the machinery has direct motor drive and the shop has facilities to produce patterns of any size. Samuel H. Kaufman, president and general manager, has been for 28 years in the jobbing pattern business in Chester, Pa., and Wilmington, Del.

The J. H. Weir Co., Coal Exchange Building, Wilkes-Barre, Pa., has been incorporated for the sale of electrical and mechanical equipment and will operate a number of sales agencies. It will act as representative of the Cutler-Hammer Mfg. Co., the Terry Steam Turbine Co., the Buffalo Forge Co., the York Heating & Ventilating Corporation, Midwest Air Filters, Inc., and the Pibrico Jointless Firebrick Co. The company's Wilkes-Barre office will be in charge of C. Ide.

## Indiana

INDIANAPOLIS, Nov. 1.

THE United Paper Board Co., Wabash, Ind., is said to be considering a one-story addition, 60 x 300 ft., to cost about \$60,000 with equipment. Work will probably begin in the spring.

The H. P. Electric Co., Bloomington, Ind., manufacturer of electrical equipment, has plans nearing completion for a new plant to cost approximately \$45,000 with machinery.

Officials of the Auburn Automobile Co., Auburn, Ind., have organized Duesenberg, Inc., capitalized at \$22,500,000, to take over the plant and business of the Duesenberg Motors Co., Indianapolis. The factory will be devoted to the production of custom automobiles to sell for about \$15,000. E. L. Cord heads the Auburn company.

The Walter Bates Steel Corporation, East Fifth Avenue, Gary, Ind., is reported to be contemplating a one-story addition to cost in excess of \$85,000 with equipment.

The Louisville & Nashville Railroad Co., Louisville, has asked bids on a general contract for new shop facilities at Evansville, Ind., consisting of a one-story engine house to accommodate 19 locomotives, machine shop, office and auxiliary structures, to cost about \$180,000 with equipment.

Myrtle E. Smith, 323 South Main Street, South Bend, Ind., architect, is completing plans for a new three-story automobile service, repair and garage building, 65 x 185 ft., to cost about \$100,000 with equipment.

The Plymouth Metal Working Co., Plymouth, Ind., will soon begin superstructure for a one-story addition, 50 x 150 ft., to cost about \$45,000 with equipment.

## South Atlantic States

BALTIMORE, Nov. 1.

JOHN J. GREER & CO., INC., 207 West Pratt Street, Baltimore, iron and steel products, has awarded a general contract to W. G. Gischel & Sons, Curtis Building, for a one-story addition.

Fire, Oct. 20, destroyed a portion of the plant of the Southern Cotton Oil Co., Dawson, Ga., with loss estimated at close to \$70,000 including equipment. Plans for rebuilding are under advisement. Headquarters are in the Produce Exchange Annex, New York.

The Georgia Power Co., Atlanta, Ga., has been organized with a capital of \$3,000,000 to take over the plants and property of the Georgia Railway & Power Co., Atlanta, and other State light and power utilities. The new owner plans expansion, including transmission line construction. The new company will be affiliated with the Southeastern Power Co., Birmingham, headed by Thomas W. Martin.

R. P. Johnson, Wytheville, Va., machinery dealer, has inquiries out for oil-operated engines, 50 to 100 hp.; also for a turbine pumping unit, three-stage, capacity 400 gal. per min., with 50-hp. engine for operation.

The State Foundry Works of Virginia, Inc., Berkley Station, Norfolk, Va., recently organized by R. E. Wood, 1612 A Street, and associates, is said to be arranging for the operation of a local foundry for the production of a patented grate bar. The company is capitalized at \$20,000.

The Board of Education, Rocky Mount, N. C., is considering the installation of manual training equipment in its proposed new high school reported to cost close to \$200,000, for which bids are being asked on general contract until Nov. 9. Wilson, Berryman & Kennedy, Odd Fellows Building, Raleigh, N. C., and Palmetto Building, Columbia, S. C., are architects.

The Yates-American Machinery Co., Beloit, Wis., manufacturer of woodworking machinery, has removed its factory branch at Macon, Ga., from 461 Fifth Street to larger quarters at Fifth and Oak Streets, where facilities will be

provided for increased production. S. C. Darling is local manager.

S. L. Davis, an official of the Southern Chair Co., High Point, N. C., and associates, has taken over the plant of the Blue Ridge Hickory Furniture Co., High Point, for the manufacture of refrigerators. A portion of the machinery installation will be acquired from a factory at Atlanta, Ga. The entire project will cost about \$75,000.

The Board of School Trustees, Newberry, S. C., contemplates the installation of manual training equipment in a proposed new high school estimated to cost \$200,000, for which bids have been asked on general contract. A. Ten Eyck Brown, Forsyth Building, Atlanta, Ga., is architect.

The Wilson-Hock Co., City Point, Va., machinery dealer, has inquiries out for a floor-type portable crane, Davis-Shepherd type preferred.

The C. H. Turner Mfg. Co., Statesville, N. C., recently formed with a capital of \$800,000, will take over and consolidate the local equipment business heretofore conducted under the name of C. H. Turner, and the C. H. Turner Foundry Co. The new company plans expansion. C. H. Turner is head.

The R. S. Armstrong & Brothers Co., 676 Marietta Street, Atlanta, Ga., machinery dealer, has been making inquiries for electric generators, 50-kw. capacity, belt and steam-driven.

The Smith Reduction Corporation, Norfolk, Va., has work under way on a new one-story fertilizer plant at Buell, Va., to be 150 x 300 ft., to cost close to \$90,000, with machinery.

## St. Louis

ST. LOUIS, Nov. 1.

CONTRACT has been let by the International Harvester Co., 606 South Michigan Avenue, Chicago, to the Woerman Construction Co., Syndicate Trust Building, St. Louis, for a one-story factory branch, service and garage building for its motor truck division at 4000 West Pine Boulevard, St. Louis, 170 x 200 ft., to cost about \$100,000 with equipment. W. E. Price is construction superintendent for the company.

The Southwestern Light & Power Co., Oklahoma City, Okla., is said to be considering a new ice-manufacturing plant at Lawton, Okla., to cost about \$150,000 with equipment.

The Crane Co., 836 South Michigan Avenue, Chicago, has preliminary plans for a one-story machine and pipe shop, 150 x 200 ft., at Oklahoma City, Okla., to cost about \$170,000 with equipment.

The Mo-Ark Oxygen Co., 1001 Wheeler Street, Fort Smith, Ark., has plans under way for a new one-story acetylene plant, to cost about \$30,000 with equipment. The company also contemplates other expansion and betterments. It has recently arranged for an increase in capital from \$91,000 to \$125,000 to provide for the work. Daniel A. Dyer is general manager.

The National Lead Co., International Life Building, St. Louis, is reported to be contemplating a two-story addition at 5500 Manchester Avenue, to cost \$75,000.

The Common Council, Stamford, Neb., has rejected bids recently received for deep-well machinery and auxiliary equipment for the municipal waterworks, and will ask new bids at an early date.

The Empire District Electric Co., Joplin, Mo., is planning the installation of additional equipment in its power station at Grand Falls, including a new power switching station, to cost approximately \$250,000 with machinery.

The Medart Co., 3500 DeKalb Street, St. Louis, manufacturer of pulleys and other transmission equipment, has awarded a general contract to the Wise Construction Co., Syndicate Trust Building, for its one-story foundry addition, 110 x 300 ft., to cost \$50,000. Edward J. Medart is president and treasurer.

The Atchison, Topeka & Santa Fe Railway Co., Topeka, Kan., is completing plans for a new engine house with repair facilities at Emporia, Kan., to cost close to \$50,000.

The Dierks & Son Lumber Co., Nineteenth and Woodland Streets, Kansas City, Mo., will proceed with the construction of a power house at its plant, 70 x 75 ft., to cost in excess of \$50,000 with equipment.

The Hurst Scrap Iron & Metal Co., 8 West Tenth Street, Kansas City, Mo., is planning for extensions, including remodeling of present works and new equipment, to cost in excess of \$85,000.

Ovens, power equipment, conveying and other machinery equipment will be installed in the three-story and basement plant to be erected by the Rex Baking Co., 4810 South Twenty-fourth Street, Omaha, Neb., to cost \$135,000, for which superstructure will begin soon.



## Milwaukee

MILWAUKEE, Nov. 1.

**R**EPORTS of machine tool business in October indicate that the volume of sales closely approximated that of September, which was one of the best months of the year. Individual orders usually are for single items or two or three machines, but there is a healthy aggregate. The automotive industries are moderately active in anticipating tool requirements for the early part of 1927, and general industry is furnishing considerable business for replacement and moderate additions to capacity.

The Chain Belt Co., Milwaukee, has acquired the entire capital stock of the Stearns Conveyor Co., Cleveland, manufacturer of belt conveyors, silos and coal handling systems, rounding out its general line of elevating and conveying machinery. The Stearns company will continue to operate as a separate organization, E. D. Stearns remaining president. Production will be carried on in the Cleveland plant as before, with surplus output to be handled in the new contract engineering building now being added to the Chain Belt works in Milwaukee. Other concerns affiliated with the Chain Belt Co. are the Sivyer Steel Casting Co., the Federal Malleable Co. and the Interstate Drop Forge Co., all of Milwaukee.

The Department of Public Works, Milwaukee, Roland E. Stoelting, commissioner, closes bids Nov. 11 on one 325-ton hydraulic press for the motor truck department of the Municipal Service Building at Sixteenth and Canal Streets.

The Crane Co., Chicago, has let the general contract to the Fluor Brothers Construction Co., Oshkosh, Wis., for the construction of a new branch house at Oshkosh, including machine and service shops, 75 x 240 ft., of which 60 x 160 ft. will be two stories. The investment will be upward of \$65,000.

The Wisconsin Cylinder Co., Milwaukee, specializing in regrinding cylinders for engines, has moved into its new building at 719-721 National Avenue. Immediate equipment needs have been satisfied, but later a number of additional units will be installed. Herman Klekow is proprietor.

The Wisconsin Auto Spring Co., 411 Prairie Street, Milwaukee, has changed its name to Wisconsin Spring & Truck Corporation to indicate an extension of the scope of its business. Watt E. Babler is secretary and manager.

The Metal Specialty Co., Algoma, Wis., has been incorporated with \$50,000 capital stock and will establish a plant to manufacture a general line of metal products. Details have not been made public. The principals in the new organization are Ernest Watz, Mark F. LaFond and Joseph and Charles Schmitt.

S. F. Bowser & Co., Fort Wayne, Ind., which recently transferred the manufacturing operations of its Milwaukee plant, originally known as the Richardson-Phenix Co., Reservoir Avenue and Buffum Street, to the main works at Fort Wayne, is now offering for sale or rent the buildings, which contain 28,000 sq. ft. Surplus equipment and complete power wiring are included in the offering. The Richardson-Phenix Co., before its consolidation with the Bowser company about four years ago, was a manufacturer of lubricating devices for machine tools, automobiles, tractors, etc.

## Gulf States

BIRMINGHAM, Nov. 1.

**P**LANs are being considered by the Shearman Concrete Pipe Co., Inc., Burwell Building, Knoxville, Tenn., for a new branch at Miami, Fla., to cost close to \$100,000 with equipment.

The Dallas Power & Light Co., Dallas, Tex., has taken out a permit to erect a two-story addition to its power plant to cost about \$50,000.

The Kennemer Brothers Ice Co., Dallas, Tex., is said to be planning the construction of a new ice-manufacturing plant to cost \$150,000 with machinery.

The Joubert & Goslin Machine & Foundry Co., Birmingham, is expanding its line of production to include evaporating and drying equipment for chemical plants, refining apparatus, etc. J. Goslin is president.

The Alabama Power Co., Birmingham, is disposing of a bond issue of \$6,000,000, a portion of the fund to be used for extensions and improvements. Work is now in progress on a new hydroelectric generating plant to develop an initial capacity of 135,000 hp. Thomas W. Martin is president.

The Texas & Pacific Railroad Co., Dallas, Tex., has

awarded a general contract to the Ware Construction Co., El Paso, Tex., for an engine house, shops and other improvements at Gouldsboro, La., to cost \$850,000 with equipment.

The Shreveport Machinery Sales Co., Shreveport, La., has been inquiring for equipment for a gypsum mill and is desirous of getting in touch with manufacturers of such machinery.

The Louisiana & Northwestern Railroad Co., Homer, La., has plans for a new one-story machine shop, 54 x 90 ft., to replace a structure recently destroyed by fire; a new one-story coach shop, 30 x 90 ft., will also be built.

The Brown Paper Co., Monroe, La., has engaged George F. Hardy, 305 Broadway, New York, engineer, to prepare plans for its mill addition for the manufacture of kraft papers. It will cost approximately \$2,000,000 with machinery.

The Texas Power Corporation, New Braunfels, Tex., recently organized, is disposing of a bond issue of \$1,600,000, the proceeds to be used in part for the construction of three hydroelectric generating plants between New Braunfels and Seguin, Tex. The company has contracted with the Comal Power Co., New Braunfels, to furnish power and transmission lines will be built for this purpose. The Fargo Engineering Co., Jackson, Mich., is engineer. F. H. Willmont is president.

The Ennis Ice Co., Ennis, Tex., is said to have preliminary plans for a new one-story ice-manufacturing and cold storage plant, to cost \$50,000 with equipment.

The Black Diamond Coal Mining Co., Age-Herald Building, Birmingham, is planning the construction of a new tippie to replace a structure recently destroyed by fire. Machinery for a washer, crusher, etc., will also be acquired, to cost in excess of \$125,000. Carl McFarlan, Johns, La., is construction engineer.

The John C. Brill Co., New Orleans, sales representatives for iron and steel products, has opened a branch office at Houston, Tex., which is temporarily located at 7052 Avenue F. The office is in charge of Milton C. Hawkins.

## Pacific Coast

SAN FRANCISCO, Oct. 27.

**P**LANs have been approved by the Great Western Power Co., 530 Bush Street, San Francisco, for the construction of eight hydroelectric generating plants on the Feather River, the first to be located in the vicinity of Oroville, Butte County, and the last near Caribou. It is expected to develop a total of 1,000,000 hp. Work on the first station will begin soon. The entire project will be carried out over a period of years and is reported to cost upward of \$50,000,000. New steel tower transmission lines will be built.

W. E. Miller, 2165 Thirty-ninth Avenue, Fruitvale, Cal., manufacturer of gas furnaces, etc., has acquired property at East Seventh Street and Thirty-seventh Avenue, Oakland, Cal., and contemplates the early erection of a new plant to cost close to \$25,000 with equipment.

The Long Beach Terminal Warehouse Co., Long Beach, Cal., has completed plans for a new six-story cold storage and ice-manufacturing plant at the West Channel slip No. 5, Long Beach harbor, where four acres was recently secured. The entire project will cost in excess of \$450,000. Edgar Cline, Petroleum Security Building, Los Angeles, is architect.

The Pacific Gas & Electric Co., 245 Market Street, San Francisco, has plans for a one-story machine shop at its gas generating plant at San Jose, Cal., to cost about \$20,000 with equipment.

The Board of Education, Oakland School District, Oakland, Cal., has plans for new manual training shops at the local high school, to cost about \$50,000 with equipment.

The Pacific Coast Steel Co., Alaska Building, Seattle, is completing plans for new works for steel fabricating and other service, to cost close to \$30,000 exclusive of equipment.

The Southern California Ice Co., San Bernardino, Cal., is considering the construction of a new plant at Third and I Streets, to replace an existing building at the same location, to cost approximately \$200,000 with machinery. It is proposed to break ground in January.

The General Sheet Metal Works, San Francisco, recently organized by James E. Guthrie and Walter M. Twohig, will operate a plant at 1529 Pine Street.

The Anacortes Foundry Co., Anacortes, Wash., has awarded a general contract to L. A. Farmer, Anacortes, for a one-story addition primarily for brass and aluminum castings.

The Killifer Mfg. Co., Vernon, Cal., manufacturer of agricultural implements, road and industrial machinery, is

contemplating an expansion program which will double the capacity of the plant. Additions and new equipment will cost \$175,000. A. W. Hudson is president.

Ground will be broken soon for the new ice making plant of the Mountain Water Ice Co., 1140 E. Street, San Bernardino, Cal. It will be one-story, 45 x 90 ft., and cost \$75,000.

The Sheet Metal Specialty Co., Los Angeles, has been organized to manufacture sheet metal products. It formerly operated a plant at Goshen, Ind., specializing in equipment for kitchen cabinets. At present the company may be addressed in care of J. A. Mew, Los Angeles.

Arrangements are being made for the purchase of equipment for the new thirteen-story Frank Wiggins Trade School, Los Angeles, which will open in February. Expenditures for machinery include \$39,000 for a printing department, \$25,000 for wood-working shops, \$12,000 for automotive equipment, \$10,000 for a machine shop, \$8,700 for a mechanical laboratory and \$8,500 for an electrical department. In addition to this \$50,000 worth of equipment has been given by local companies.

## Canada

TORONTO, NOV. 1.

**D**EMAND for machine tools continues good in this territory and sales for the month of October were slightly better than those for September. From the volume of inquiries being received, it is believed that a strong demand for equipment will continue throughout the remainder of the year. The automobile industry continues to head the list of active purchasers, and the railroads also have been good buyers of shop equipment.

The Steel Co. of Canada, Ltd., Hamilton, Ont., is installing machinery for the manufacture of chain link fencing which will enable the company to supply types and sizes from  $\frac{3}{8}$ -in. to 4-in. mesh, using wire varying from 19 gage to 6 gage, in widths up to 10 ft.

The Pere Marquette Railway, Elm Street, St. Thomas, Ont., proposes to make changes in its local shops, and equip all machines with motor drive at a cost of \$70,000.

The Midland Shipbuilding Co., Midland, Ont., has received contract for building two steel freighters for the Canada Steamship Lines, Ltd., 9 Victoria Square, Montreal, and will be in the market for materials.

The Sangamo Meter Co., 183 George Street, Toronto, whose factory was recently destroyed by fire, has awarded a number of contracts in connection with a new plant to be erected at a cost of \$35,000.

Sub-trades will be let in connection with an addition to a boiler house for the Canada Sugar Refinery Co., Montreal, to cost \$100,000.

Construction work is under way on an addition to the Riverbend mill for Price Brothers & Co., Quebec, which will house two newsprint machines with a daily capacity of 100 tons. Upon completion the company plans the erection of another mill to have a daily capacity of 200 tons.

Application has been made to the Quebec Public Service Commission, Quebec, by the Canadian International Paper Co., for permission to erect a power plant on Mountain Falls on the shore of the Red River, County of Argenteuil, Que. A dam 125 ft. high and 200 ft. wide will also be built.

The Maple Leaf Steel Mills, Ltd., Edmonton, Alberta, has taken over the plant formerly operated by the Edmonton Iron Works Co., Ltd., and will operate it indefinitely.

## Foreign

**T**HE Municipal Council, Sao Joao d'El Rei, Brazil, is asking bids (closing date not announced) for the construction of a municipal hydroelectric power plant, with initial capacity of 4000 hp., designed to be increased to 8000 hp. The American Consulate, Rio de Janeiro, R. Cahn, vice-consul, has information regarding the project.

The South Porto Rico Sugar Co., 165 Broadway, New York, has authorized a stock issue of about \$1,120,000, the proceeds to be used for the purchase of the plant and properties of the Yngenlo Santa Fe, C. por A., comprising the Central Santa Fe sugar mill at San Pedro de Macoris, Santo Domingo, adjoining the properties of the Central Romana, Inc., a subsidiary of the purchasing company. The acquisition totals approximately 75,000 acres, with mill equipped for an output of about 40,000 tons per annum. The new owner contemplates extensions and improvements, including equipment installation.

## THE LAST WORD

(Contributed by the Reader Service Department of The Iron Age Publishing Co.)

**A** NEW invention, a style change, a public whim, can ruin an entire industry. The impermanency of almost every line of business is daily impressed upon us. One by one the old names disappear—companies thought to be as enduring as Gibraltar. Not a great many live to have a twenty-first anniversary.

Those manufacturers who advertise in THE IRON AGE to sell their goods could hardly be regarded as of the ephemeral type. Yet, of the first 50 listed under the letter "A" in the issue of Oct. 26, 1916, only 36 are still in business. Within ten years, 28 per cent have passed out of existence.



"... some of the largest English steel plants are plainly headed for a crisis through lack of willingness to scrap old equipment."—John Calder, THE IRON AGE, Oct. 2.

England has no monopoly on manufacturers who shut their eyes to the fact that it requires considerable enterprise and energy even to stand still in these highly competitive days.



**B**ACK in 1861, J. Leander Bishop wrote "Finis" in his magnum opus and tucked his quill pen back into the rack. It was a considerable opus, too, entitled "A History of American Manufactures," and published by Ed. Young & Co., Philadelphia.

Sixty-five years later the Drexel Institute, also of the Sesqui City, sends out an urgent call for this work. If you know where a copy can be procured, Mrs. Anne W. Howland, librarian of the institute, will be glad to know about it.

The man who runs a confectionery and boiler shop has nothing on Macartney & Brinkman Brothers, San Francisco, who are listed in Dun's as:

"Mfrs. Mah Jongg Racks and Mining Mach."

There may be a more incongruous combination than this, but we have yet to hear of it.

"Did you know that Governor Hogg of Texas, after whom Jim Hogg County (mentioned in your column) was named, had three daughters—Ima, Yura and Sheza?" inquires E. F.

It's a fact.

**I**F you should aspire to become an opera star, chances of success would be somewhat in the neighborhood of 1 out of 10,000. But should you view with favor the manly art of plumbing, your chances of becoming a plumber would be 10,000 to 1.

Which is the reason why most opera stars make so much more than most plumbers, as Adam Smith pointed out in "The Wealth of Nations," at the time King George was our lord and master.

The compensation in any form of endeavor should be in proportion to the risk of failure involved. A business firm that makes only 6 per cent profit on its investment is not making as much as it should. For the average corporation has little better than an even chance of making any profit at all. Bradstreet's reports that of 298,933 corporations in existence in 1923 only 179,360 made a profit. Forty per cent, 119,573, sustained losses.

A. H. D.





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# THE IRON AGE

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